



SATURDAY, JANUARY 20, 1872.

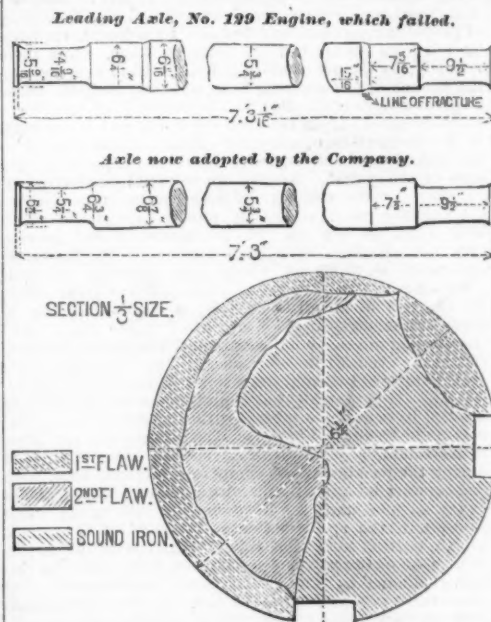
Railway Axles.

A report to the Board of Trade "Upon Certain Accidents which have Occurred on Railways during the Months of June, July and August, 1871," has just been issued. It may be read with advantage by all engineers interested in the working of railways, but it contains little which we need transfer to our pages. We have the old story of hard-worked officials, crowded lines, imperfect signaling and telegraphic arrangements, over again. A portion of the report is devoted to a detailed account of certain experiments made by Captain Tyler with the signal cord; but these have already been fully dealt with in our pages; we need, therefore, do no more than state that Captain Tyler's views coincide precisely with our own, condemning the system as faulty in principle and imperfect and complex in all its arrangement. The details of an accident resulting from the breakage of the leading axle of an engine on the Northeastern Railway constitute the text from which we desire to draw a few conclusions.

The particulars of this accident are very simple. The leading axle of engine No. 129 gave way while traveling at a speed of about twenty-five miles an hour, with the 2.40 express train from Scarborough to York. The leading wheels of this engine were 4 ft. in diameter. The coupled drivers were 8 ft. in diameter, the total running weight of the engine was about 30 tons, of which 10 tons 8 cwt. were carried by the leading axle. The dimension of the axle, the nature of the flaw and the place of the failure are shown in the accompanying sketch. The axle was put under the engine in 1865, and up to the time of fracture it had run 189,034 miles. It was made of Low-moor iron at the Northeastern Railway Company's works at Gateshead. Little or no damage was done to the train or passengers. It will be seen from the sketch that the axle broke just at a corner, and this differs in some degree from other failures of the kind, in that no very sharp angle existed at the point of failure. It is a commonly-received theory, that in order to avoid all risk of fracture in axles or crank shafts it is only necessary to "round the corners out well," but we have reason to think that this theory is in some respects defective. It does not go far enough. We have over and over again seen crank shafts broken in which very large curves were adopted at the corners. It is certain that a shaft with a right-angled union between the body and the journal, or neck, will break; such a construction, indeed, simply holds out a premium for failure, but it is not certain that any reasonable amount of rounding out at corners will leave those corners so strong as any other portion of the axle, and in this respect the theory is, as we have said, defective. Everything depends, as regards the durability of an axle, on the shape which is given to it; but it does not appear that engineers yet know what is the best shape for an axle. There must be some form which is better than any other, but we find very wide diversities of practice in this respect on our railways. No two lines are worked with axles of precisely the same shape; nor is there a line in the kingdom on which several distinct patterns of axles may not be found. It is true that the differences in form are, for the most part, very small; but it must not be forgotten that, in dealing with the shape of axles, we are also dealing with very minute quantities. It may appear to be a very trifling matter—a question of little or no importance—whether we strike the arc of a rounded corner to a radius of three-eighths of an inch or to one of half an inch; but it is none the less true that the durability of the axle having the latter curve may possibly be counted by years, while that of the former does not exceed a few weeks. It is quite certain that, notwithstanding the labors of Mr. Bramwell and others, much has yet to be learned as to the functions performed by rounded corners, and the effects following on certain changes of shape in axles.

The strains to which a railway axle is exposed are complex in their nature. In the first place, we have under ordinary conditions the load applied to two overhanging ends or journals projecting beyond the wheels which constitute the points of support. The journals may be treated as cantilevers carrying a distributed load. The force tending to break the axle in the body between the wheels acts upward. It is due to the tendency of the cantilevers (journals) to turn about their center of support—the rails—and very little reflection will suffice to show that the points exposed to the greatest strains are located just inside and just outside the wheel bosses; and it is at one or other of these points that axles generally give way. The fracture of an ordinary axle about the middle of its length is so rare as to be almost unheard of. The point just inside the boss of the wheel is exposed to an additional breaking force quite independent of the load. This force is a result, in the first place, of the tendency existing in coned wheels to slip down inside the rails, and, in the second place, the shocks and strains incurred in passing over points, &c., tending to force the lower portion of one or both wheels inward toward the center of the track. The bending moment due to this cause increases, of course, in the same ratio as the height of the wheel—this force does not in any way affect the journals outside. The breaking strain on the inside of the boss is the sum of the strain due to the loads on the journals and of that tending to force the lower part of the wheel inward; the strain at the outside of the boss is that due to the load on the journals alone. The journals are so short that it is impossible to introduce any means of giving them elasticity, but this is not the case with the body of the axle, and it has been found advantageous to taper it down in the center, not only because such tapering reduces weight, but also because it imparts a certain amount of elasticity which probably helps the iron at the point

just inside the wheel boss. Bearing these facts in mind it becomes evident that the worst possible place for any notching-in or change of form in the axle is just within or just without the wheel boss. But we find in practice these are just the two places at which a change of form is always made. The wheel boss comes right up to the beginning of the journal on the outside, and we usually find a shoulder inside, against which the wheel is forced home. We need not seek further for an example than the broken axle we have sketched above. The strongest possible axle would be one tapered down in the middle so as to save weight and impart a little elasticity, but for the rest perfectly parallel throughout boss and journal, or at most, slightly coned from a point somewhere inside the wheel boss to the outer end. It is usually argued that we must provide a shoulder against which to force home the wheel or it will become loose, but this is not the fact. If the wheel be properly forced on and properly wedged, an almost imperceptible taper will suffice to make it secure; as an example, we have given a sketch of the axle now being adopted by the Northeastern Railway Company, which is thoroughly sound in principle up to a certain point. We have the general taper and the easy cone for the wheel bed, but beyond the wheel we come on a shoulder and a journal. To make this a thoroughly good job the axle should have been continued straight through to form the journal, and end play might have been prevented either by end stops in the axle-box, or by a modification of the form of the wheel boss. Of course we shall be told that the friction of the axle would have been increased had the journal been made 6 1/2 in. in diameter instead of 5 1/2 in. But this is not quite so clear as it seems at first sight. The load on each journal being, say, four tons, a 5 1/2 in. journal supplies none too much surface; and it is possible—nay, more, it is extremely probable—that the additional surface supplied by the extra inch of diameter would permit lubrication to be better effected. Very few experiments have been carried out to determine the influence of journal diameter on train resistance. The most elaborate with which we are acquainted were made by Nicholas Wood. They will be found in the second



edition of "Wood on Railroads," 1832, and they went to show that within certain limits the journal resistance is practically independent of the diameter of the bearing. On this subject information of a recent date, and carried out under modern conditions of railway traffic, is much wanted; but, in the absence of definite facts to the contrary, we hold that little or nothing is saved by reducing the diameter of the axle to obtain a journal, while much risk of fracture is certainly incurred by the alteration of form.

There is yet another point to be considered in the construction and use of railway axles. We have seen that the strain at the inside of the boss is the sum of the load on the journals, and of what may be termed the "nipping" forces tending to bring the wheels together at the rail and to open them at the top. If, however, we put the bearings inside the wheels, then the load on the journals will directly tend to counteract the action of the nipping strain, and the force tending to break the axle off inside the boss will be as the difference, not as the sum, of the two forces. There are certain reasons which make it eminently convenient that carriage axles should have outside bearings, but these do not apply with so much force in the case of wagons, and they do not apply at all in the case of locomotive engines. Just inside the wheel is, beyond question, the proper place for the bearing; and it is a somewhat instructive comment on this argument, that experience has proved that the crank shafts of locomotives with inside bearings last just twice as long as those of locomotives with outside bearings.

Finally, we would call attention to the sound theorem laid down by Captain Tyler in the report before us, namely, that every axle should be so constructed that it will be almost certain to fail at some place where an incipient flaw can be readily detected; but railway axles, as they are now made, almost invariably fail close up to the wheel, or within the boss in a place where it is impossible to detect a crack. Captain Tyler states that the new Northeastern axle we have sketched appears to be likely to comply with the required condition. It is one-fifth larger in the wheel-bed than it is in the body, whereas the old axle was scarcely one-twelfth; and during the first week in August the leading axles of two good engines, carrying each twelve tons, and of two passenger

engines, carrying each ten tons, and of the new pattern, have been taken out in consequence of the detection of flaws about the middle of the axles, which would have ultimately caused fractures; "and thus," adds Captain Tyler, "accidents of the nature of that on which it is now my duty to report, have actually, by the adoption of this improved form of construction been absolutely prevented."—*The Engineer.*

Contributions.

BOILER EXPLOSIONS.

TO THE EDITOR OF THE RAILROAD GAZETTE:

"Terrific boiler explosion! Two men killed! The boiler was almost new, having been used only about ten days."

So says an account of the explosion of a stationary boiler in Chicago.

The boiler had not "recently undergone thorough repairs," (which, according to good authority, means, "A boiler already weakened by age and bad usage is still further impaired by patching,") but was new, and better even after the brief ten days of usage than when a fire was first put under it. The boiler had by this time received its permanent set, and there was now no violent expansion and contraction, and no doubt the parties owning it began to think that they possessed a good boiler, when a terrific explosion takes place, and two men are killed and property to the amount of \$2,500 destroyed. This account, from a reliable source—a local paper—is doubtless correct; but, remarkably enough, it develops a case of boiler explosion under circumstances directly opposite to that referred to in a recent article in the GAZETTE, but equally disastrous in its results to life and property.

The writer of this has not the ability—if he had the desire—to present a "fine-spun theory on boiler explosions," but he desires to simply state a few *coarse-spun* facts, as they have occurred to him and others, in practice.

Mr. Hayes, of the Illinois Central Railroad, in his admirable report to the Master Mechanics' Association on Boilers and Boiler Material, says: "I have at different times tested the tensile strength of 5-16 in. iron boiler-plate cut from old boilers, and found the breaking-strain to be from 60,368 pounds to 72,025 pounds per square inch of section." This is above the average of new iron. The writer has before him at this time two pieces of iron, cut from a sheet that has been in use for fifteen years in a locomotive boiler, and was taken out on account of grooving in the flanges. These were taken just as they came from the boiler, bent and doubled down cold, with scarcely a fracture. From this we must conclude one of two things: Either this iron was of a superior quality, or else iron does not deteriorate by using, except in thickness. If we say the former, then there is work, not for the master mechanics, but for the iron manufacturers. Iron cannot be too good for boilers, and what we have had we should have again. If the latter position is taken, then here is work for your correspondent to hunt up some other cause for boiler explosions beside age and patching. And, as fit cases for study and reflection, his attention is called to the accident mentioned in the first part of this article. The boiler was only ten days old and exploded with terrific force. Again, at Wakeman, Huron County, Ohio, December 28, 1871, an awful boiler explosion took place, resulting in the death of four persons. The boiler manufacturers said they need not be afraid of running up the steam to two hundred pounds; "but we hear," adds the correspondent, "the iron was rotten." This boiler was new. It had not deteriorated by age, but it was rotten from the start. The day after this last accident a boiler blew up in Baltimore, corner of Pratt and Tremont streets, killing three and seriously injuring ten others, and making a complete wreck of the building. What a commentary upon the assertion that none but old boilers explode!

Here are nine deaths within two weeks caused by the explosion of new boilers.

The writer of this has authentic information of the explosion of two locomotives within the last four weeks on one road, and both of them new or comparatively so. One had only run three months, and was of one of the most approved patterns in the country. The other was three years old; but unfortunately for those who believed that nothing but a patched boiler will explode, it had not that article to depend upon for an excuse.

There have been two explosions of locomotives within the last three weeks, under circumstances that would lead one to believe that if they were not new they certainly could not be very old: for the roads on which they took place are not "some of our leading lines of thirty years' standing that have never had an explosion," and it might reasonably be supposed the machinery would be new and in good condition.

Again, permit me to quote that reliable authority and read from a local paper of Dec. 4: "Explosion of a locomotive boiler! An engineer killed!—An engine, of a

fast train on the Louisville & Nashville Railroad, exploded its boiler early this morning while running near Auck Lodge Station, throwing eight cars of coal and three empty cars off the track, killing instantly C. Jamison, engineer, and severely scalding the fireman, named Steel, and a brakeman, named Preston. The engine was a new one, and no cause of the explosion is known." These are coarse-spun facts, to be accounted for on some other score than that of being old or patched boilers. It may be that letters master mechanics sometimes receive from supply agents and manufacturers saying, "In ordering iron be particular to state what part of the boiler the iron is for," have something to do with these terrific explosions. If the iron is for sheets that are to be flanged it must be good, or its defects will be discovered. The test of iron is in the working of it. If for the cylinder part of the boiler, it will never be known that it is rotten; and if, in after years, the boiler should explode, we will be told that "the iron had become crystallized," and "it could be broken with a hand hammer," when, if the truth were known, it could have been broken with a hand hammer when new just as easily. Having quoted from the Master Mechanics' Association to prove that iron is often taken from old boilers and found to be equal to the best of new boiler plate, it is due to our subject that we give the testimony of those who unequivocally assert that they found old boiler iron "good for nothing," and explain what to the writer seems the cause of the apparent difference of opinion.

It was from the outside shell of boilers that the tests of strength I have given were made, and from this source all, or nearly all, of the dangers from explosion spring. Those of the members who expressed their opinion upon this subject either made special reference to the iron taken from fire-boxes, or the language used implied that the tests made were of iron from that portion of the boiler. That the action of fire and water on fire-box sheets will harden and make them brittle no one will attempt to deny, but that it will make a boiler any more liable to explode will admit of some doubt. Iron to be flanged, as we have before stated, *must* be good; but when successfully formed into an inside fire-box the quality of being soft and ductile is no longer required, and dependence on the *transverse* strength is mainly relied on for the durability of the fire-box. If the iron or steel resists bulging between the stay-bolts, the better hold the bolts will have on the sheet; and for this purpose the iron becomes stronger as it becomes hardened. The writer had occasion recently to examine a copper fire-box that was bulged between the stay-bolts to ascertain the hold they had on the inside in the sheet, and found in nearly every instance the hole was so stretched that the bolt could slip through without injury to the thread, the riveting of the stay-bolt on the end alone holding the sheet intact. And it is this bulging between the stays and the consequent cutting away of the copper sheet that have led master mechanics to abandon its use for that of steel or iron. But suppose an old boiler should be found, the iron of which was brittle outside and in, which would be the better argument, to say the iron was of an inferior quality to begin with, or that some good iron becomes better, and some poorer, by use?

Since we have the undoubted evidence that tests carefully made prove that the iron taken from some old boilers is as good—according to thickness—as new iron, then it must rest with those who believe that the outside shell of a locomotive boiler becomes rotten and deteriorated, except in thickness, when they take out this brittle, bad iron to prove that it was *good* when put in use.

The iron we use, and why boilers explode, may furnish occasion for more

COARSE-SPUN FACTS.

Car Propulsion by Pneumatic Power.

BY JAMES A. WHITNEY, MECHANICAL ENGINEER.

[CONCLUDED FROM PAGE 12.]

[Paper read before the New York Society of Practical Engineering, January 3, 1872.]

In further reference to each of the three classes of pneumatic apparatus sketched in the earlier portion of the present paper, in is necessary to consider in each the degree of utility thus far attained with it; the most feasible methods of obviating its defects; and the conditions under which it may be most advantageously adapted to the needs of travel in New York city. For whatever, in this line, can be made practically successful under the drawbacks encountered in the metropolis, need excite no apprehensions of failure in any other locality. First in importance, as in the date of its original conception, is Medhurst's earliest scheme, known of late years in England as Rammell's system, from its—in recent times—most prominent advocate, and illustrated in this country by that fragmentary undertaking, the pneumatic tunnel under Broadway, which, with a passenger car running a distance of three hundred feet, has confirmed, on this side of the ocean, the

favorable expectations induced from Rammell's experiments, in 1861, with baggage trucks driven a quarter of a mile through a cast iron tube or tunnel of two feet nine inches height, and a width of two feet four inches, narrowed at the bottom to two feet two inches. This line was worked by the partial exhaustion of the air in front of the car, and with a pressure behind of from four to six ounces to the square inch, a speed of twenty-five miles an hour was obtained. Four years later, the completion of the tunnel from Holborn to Easton, one and three-fourths miles, afforded opportunity for more complete, definite and decisive trial. This tube in its cross section was of horseshoe form, four feet six inches high and four feet across. In lieu of the longitudinal shoulders which, in the experimental line, had been made to do duty for rails, common wrought rails were employed, fixed upon suitable bed timbers arranged lengthwise under them. The goods trucks weighed each a ton and a half. A train of four trucks with an aggregate weight of ten tons was forced through the tube with a blowing pressure of five to six ounces per square inch, or a vacuum equal to about one ounce less, and this at a speed in no degree inferior to that obtained in the previous or purely experimental trials. The expense of transport for freight was found, by careful calculation, to be less than one penny, or two cents per ton per mile, including interest on cost of engine, wear and tear, fuel, attendance and incidental work in the establishment. About the same time another trial on a larger scale was made with a brick tunnel six hundred yards long, nine feet in height and eight feet in width. The carriage was fitted with a fringe of bristles, reaching nearly to the brickwork, to reduce windage, and the twenty-foot fan by which the blast was furnished was driven by an old locomotive engine jacked up, and with belt-wheels substituted for its drivers. Only a small portion of this line was level; it had at one place a gradient of one in fifteen and curves of only eight chains radius. The car traversed the whole distance in fifty seconds, with an atmospheric pressure of two ounces and a half to the square inch. On the whole, without adverting to more extended and more recent trials, it may be assumed that, years ago, experience demonstrated the feasibility of propelling cars through tunnels by atmospheric pressure at from twenty to forty miles an hour, while theoretically, by the use combined of an air-blast and vacuum, the probability of securing a speed nearly or quite twice as great is apparent. But in the running of cars for a distance equal to that between the upper and lower parts of Manhattan Island, numerous details would require to be worked out and adjusted to secure the practical success of the system. Among these would be that of arranging for the stoppage of one car or train without interference with others in motion along the route, and which in the use of a vacuum would necessitate the adoption of a plan equivalent to the valve-separated sections of Clegg and Samuda in their otherwise quite different plan. It is true that, by the use of an air-blast only, a continuous line of cars might be propelled by what might be termed the moving air cushion throughout the length of the tube, but in the event of the stoppage of the foremost on the line, danger of collision from those behind would be imminent. It is possible that modifications of the turnouts applied in pneumatic tubes for the transmission of parcels could be applied in those for passenger transit. That of Needham, an American invention, brought forward during the past few years, comprised a circuit tube, with ends connected at a suitable distance apart with the main or transit tube, and used in connection with valves which shut off, in the space between the ends of the circuit tube, a portion somewhat longer than the carrier or piston. One of the valves was shut in front until the carrier, cushioned by the air in front, was stopped. The other valve in rear was then closed, the blast being thus directed through the circuit tube around the inclosed portion of the main tube. The top of such portion, binged for the purpose, was then opened to admit access to the carrier. With the circuit tube entering the main at a slight angle, and with automatic switch-operating mechanism to shift the rails, there seems no good reason to doubt that, by means substantially like those just detailed, cars in an eight or ten-foot pneumatic tube could be stopped at stations without interfering with the continued passage past of cars previously behind them in the tube.

The points to which reference has just been had, wherein the development of improvements is still required, are not so abstruse as to leave any doubt as to the practicability of securing them, neither can there be much doubt as to the conditions, and the sole conditions, under which the system can be applied in New York and other cities. That pneumatic tunnels, of only a few feet diameter, dark in spite of gas-jets, and damp in spite of the ever fresh current of air, are not adapted to popular needs and wishes, is shown by the fact that the projectors of the Broadway Tunnel are already agitating for the privilege of making a tunnel thirty feet in width, in which this plan of pneumatic propulsion will prove inadmissible. That its use on the surface is out of the question is manifest at a glance. There remains then only an elevated railway as affording an opportunity for its use, and with such it would prove superior to any other method of propulsion yet suggested. Let an elevated pneumatic tube be carried over the buildings and cross streets, sustained on iron supports constructed on the principle of a suspension bridge over each block; let this tube be of wrought iron for strength and lightness; lined with wood for moderate warmth and for reduction of friction to the air-blast; glazed throughout its length with panes of sufficient size and numbers to light it well; furnished with turn-outs, to enable one car to be stopped at every station without interference with the others; furnished with electric signals automatically actuated by the cars themselves to indicate their approach to the stations; and place the working of the line, from the lowest duty to the highest, in the hands of educated, careful and properly remunerated engineers, and the question of quick transit, in one of its phases at least, will be solved with greater satisfaction to the public and credit to the engineering profession than the most ardent advocates of

speedy passenger travel now dare hope for. The lighting of the tube by windows, which would constitute a most essential element of success, would not, as might at first appear, be a matter of much practical difficulty. Although brittle, glass is comparatively strong, and would resist many times the pressure required to be brought upon it in working the line. An example, apropos in this connection, of the ability of glass to resist pressure, was given some years since in steam-boiler experiments of the Franklin Institute, in which the plate-glass window of a boiler withstood the pressure until it rose suddenly to one hundred and eighty pounds to the square inch.

Allusion has already been made to the proposed supersession of the present Broadway tunnel of eight feet diameter by one thirty-one feet in width, eighteen in height, and furnished with double tracks. In the plans made public, no information is given as to the motive-power proposed; but it is manifest that cars running in opposite directions could not, unless the tunnel be longitudinally partitioned from end to end, be propelled by the fan-blast or exhaust used in the present experimental work. It is hardly likely that the folly of wire-ropes will be repeated in this case, or that the slow power of horses will be used on a railway built at such cost. Locomotives may be attempted; but their employment, because of smoke, foul air, and jar to the foundations of buildings, should not be tolerated. The motive-power for such an underground line is not of less importance than the construction of the line itself, and the latter should, from the first, be calculated with especial reference to the former. Although the suggestion is not free from difficulties, there is good reason for belief that the Clegg and Samuda system, a tube with a longitudinal valve-covered slot in the top, and an internal piston connected with the car running on an external track, would effectually subserve the purpose of transit through such a passage-way under the streets. During the existence of the line between Kingston and Dalkey, a gross load of fifty tons was at times propelled at a speed of fifty miles an hour, the gradient being one in one hundred and fifteen, the diameter of the main fifteen inches, the vacuum at the greatest equal to twenty-five inches of mercury, and the engine of one hundred horse-power. The leakage of the valve absorbed about ten horse-power per mile, or thirty horse-power per section of three miles. The cost of such a railway, laid on the surface, was about twenty-five thousand dollars per mile, at the prices of labor and material a quarter of a century or more ago. The loss of power by leakage through the valve appears to have amounted to from one-fourth to one-third of the whole. But this, while serious when in direct competition with locomotives, would be of minor consequence when the great patronage of a New York City railway warranted unusual outlay, and, as far as the ventilation at the tunnel is concerned, would prove a positive benefit to the line, though at the cost of fuel for the engine. It must be remembered too that the valves devised by Clegg and other projectors of his time were before the introduction of india-rubber, a substance better than any other adapted to such a purpose. There is apparently no good reason why a strip of caoutchouc so applied as to press laterally over the longitudinal opening in the tube, should not serve, in a much more efficient degree, all the functions of the complicated device of Clegg and Samuda's railway. Should it prove too slight in tensile strength, a wire rope could be imbedded within it, and should its yielding power be found insufficient, this essential could be increased by giving a cellular consistence to the material by methods already known. The deterioration which would occur from contact of oil or grease necessarily used for lubrication would, in the use of india-rubber, as just indicated, require that it have cemented upon it a covering of leather or the like.

While there can be no doubt that both an elevated and underground railway, properly constructed, will meet with the most extended and profitable patronage from the citizens of New York, there is no reason to suppose that the surface lines will ever be given up, and on them some motive-power other than horses or steam should be provided. Of the several systems of pneumatic propulsion, that which embraces tanks of compressed air, serving in lieu of steam in the driving of engine pistons, is the only one adapted to the purpose. A number of trials have been made during the past few years with alleged satisfactory results, but it is doubtful if the chief obstacles to its employment at all seasons of the year have been overcome. Among recent investigations designed to increase the utility of the system is one in which the tanks are to be made of paper, obviously to prevent as far as possible the loss of power by radiation of heat generated from the compression of air in the tanks; another covers the use of a number of cylinders connected by tubes to form together the compressed air reservoir of the car, and which admits of a more convenient arrangement of as well as greater strength in such reservoir. The inventor of this also claims the combination with the heating apparatus of the car of a conducting pipe from the reservoir in such a way that the compressed air, while passing to the engine, may be heated to increase its expansive power, while still another feature of his apparatus is a muffler or box lined with soft fibrous material, to receive the exhaust from the engine and deaden its sound.

The plan of making the reservoir of non-conducting material might possess a certain advantage if the air could be used as soon as compressed, or before time for any considerable radiation had been afforded. The arrangement of the air-holding cylinders in connection with each other would afford in some cases a source of convenience, but would not be essential to the arrangement of the cylinders with regard to the economy of space, as the cylinders might, in succession, be brought in communication with the engines. The need of the muffler seems doubtful, and, as the air could hardly leave the cylinders quite reduced to atmospheric pressure, it would probably be much better to throw the exhaust into the car-heating furnace in winter to urge the blast, and in summer into the body of the car to cool the atmosphere therein. The heating of the compressed air to

increase its power of expansion would be likely to be of advantage only when incidentally incurred in protecting the cylinders from the congelation of vapor contained in the air, and liable to be frozen by the absorption of heat in the expansion of the air in working the engine. To this end, it would be advisable to arrange the cylinders within annular jackets in open communication with the furnace used for warming the car, and which should be constructed with especial reference to this use in connection with the driving motor. This last should furthermore be so applied in connection with the brakes, that the throw of a lever would instantly turn the pneumatic power from the propulsion of the car to its stoppage, which, by this means, could probably be accomplished in less time and within a shorter space than could be done with horses at an equal speed. There is in addition to those just specified another point which is now beginning to attract the attention it deserves, viz., the regulation of the inflow of air to the cylinders. This has been accomplished, it is claimed, by very simple devices, and, indeed, the mechanism need not be complex, for the connection of

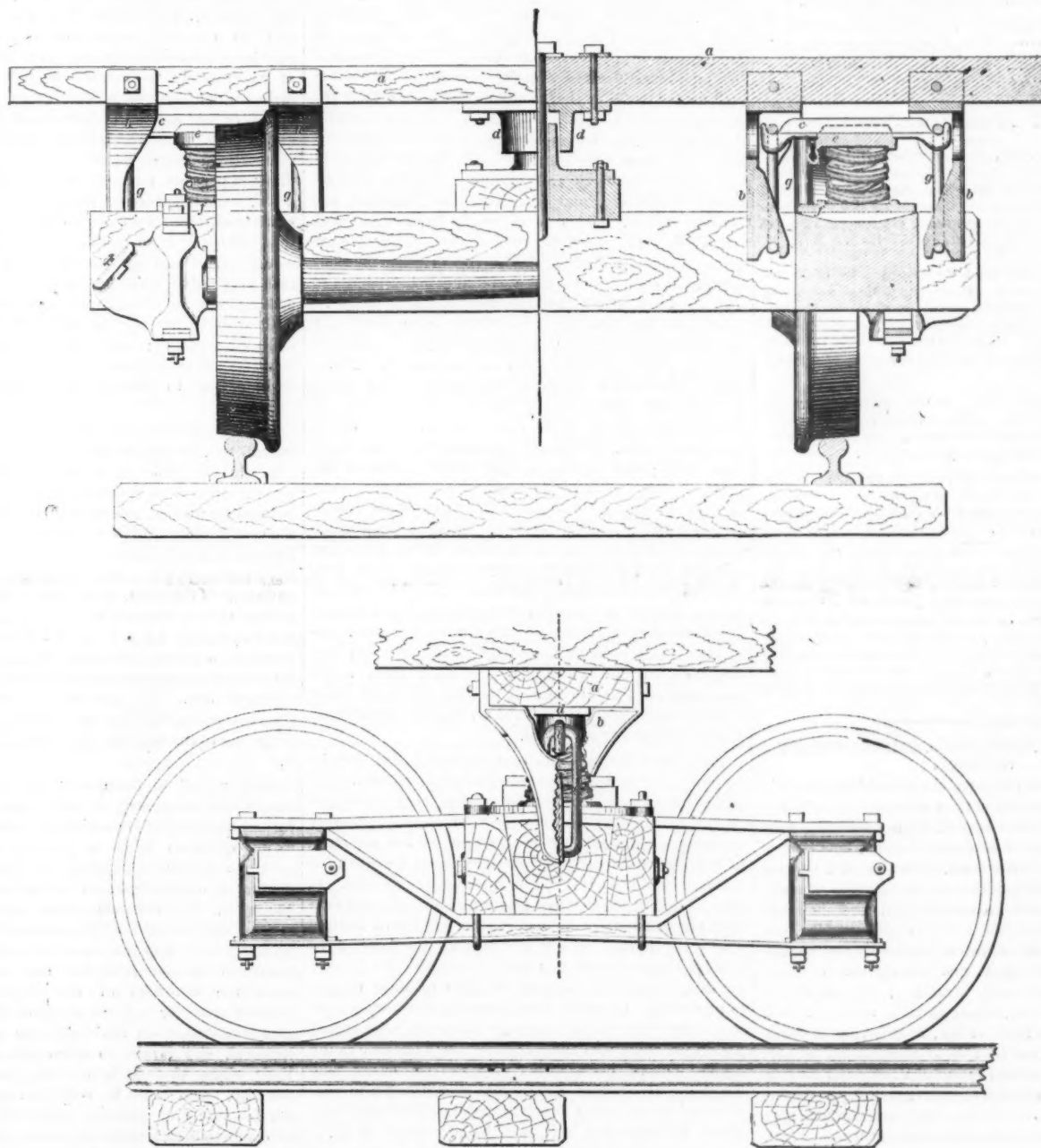
Wilson's Improved Car-Truck.

For the following description of this truck, with the engravings, we are indebted to the *National Car-Builder*. It was patented by the inventor, Mr. T. L. Wilson, Feb. 16, 1869. McMurray, Fuller & Co., of Toronto, Canada, are ready to negotiate concerning its introduction and use. It has been adopted on the well-managed Great Western Railway, and on the narrow-gauge Toronto & Nipissing. On the latter it is reported that cars with these trucks weighing 11,000 carry regularly 8,500 feet of green lumber estimated to weigh 26,000 pounds:

The design of this truck is to obviate the necessity of friction-wheels, plates, rollers and swinging bolsters, which have hitherto been employed in their various combinations to enable the car to adapt itself without strain to the curvatures of the track. The tendency of these devices to spread the track when the truck and car pass curves has never been completely overcome; and, as a

are so arranged as to act in conjunction with the crown-plate, and prevent the truck from diverging from the permanent way in case of accident; the oval shape of the crown-plate, catching the bolt that acts in it, and forming a resistance simultaneously with the spring-link brackets dropping between the truck-frame timbers on both sides of each wheel, thus giving five distinct points of resistance, and making it impossible for the truck to swerve from the track. A radial and lateral motion is secured to the car on the axis of the truck by the swinging links and oval crown-plate, giving the car an easy adaptation to curves without strain and unnecessary friction, and avoiding the expense of a swinging bolster.

The general and particular advantages of this improvement will be apparent on examination to all who have a practical knowledge of what is requisite in a good car-truck, namely, simplicity of construction, economy of first cost, strength, safety and durability. The engravings represent the truck in a loaded position for freight-car. The gauge is four feet eight and a half inches. In the references, *c* is the link-carrier, *e* the spring cap, *f* the spring-seat, and *g* the carrying-link.



WILSON'S IMPROVED CAR-TRUCK.

the stem of a pressure-gauge with a valve governing the size of the cylinder, inlet-ports would seem to fully embrace the principle of an efficient device for the purpose.

The elements enumerated as essential to the success of the system will necessitate the construction of a street-car radically different from those now in use, especially in the matter of weight. But there should be no difficulty in reducing the weight of the car, so as not to exceed, with its engines and reservoir, nine thousand pounds, the weight of the clumsy vehicles that now traverse the tramways of New York.

In conclusion, such in brief are the ideas of the writer on the most important application yet suggested of so-called pneumatic power. As to how far they will ever reach fruition in the solution of the vexed question of city transit, it is impossible to say. But they have been deduced, without reference to any especial plan or theory, from the actual results of recorded practice not less than from the well-known laws of science, and have led him to believe that passengers may be cheaply carried to and from the City Hall at from twenty to forty miles an hour with all the comfort of ordinary railways, and none of the dangers or inconveniences incident to the employment of locomotives.

consequence, both rolling-stock and permanent way have suffered more or less from the defect.

The construction of this truck and the nature of the improvement made by the inventor are very clearly shown in the accompanying engravings, representing a sectional end view, and also side and end elevations. By substituting the reverse-coil nest spiral or Dinsmore spring, in place of the heavier and more bulky elliptic, several very obvious advantages are secured in the satisfactory working of both car and truck. The spring being placed midway between the tread of the wheel and the center of the journals, the weight of the load is thus concentrated at the proper place, instead of being carried too much inward toward the center of the axle—as is the case with all swinging-bolster trucks—and causing the bearings to wear more on the inner than on the outer ends. The elliptic spring, owing to its size, could not be so placed without interfering with the wheels; nor is it necessary to weaken the truck-frame by cutting it away to make room for the spiral spring, as was the case with the elliptic.

A crown-plate *d*, of an oval instead of a cylindrical form, is employed to facilitate the lateral play of the bolster *a*. The spring-link brackets *b*, it will be seen,

Union Car Spring Company.

The company reports a large and steadily increasing business in its peculiar and widely used manufactures. It now has factories in Springfield, Mass., Jersey City and Cincinnati, and agencies in Troy, N. Y., Wilmington, N. C., Cincinnati, Chicago, St. Louis, Philadelphia and Montreal. Mr. F. G. Saltonstall was appointed General Agent, to take effect January 1, in place of Col. Leavitt Hunt, resigned. Mr. Joseph F. Fulson remains local agent in New York.

"Strong" Air.

The *New York World* is convinced of the propelling power of the atmosphere, as it shows by the following paragraph:

"The Society of Practical Engineering has hit upon the true solution of the problem of street travel, 'Atmospheric Power for City Cars,' having been the subject of discussion at its last meeting. Certainly, if any reliance is to be placed in the evidence of one's sense of smell, the air in most of our city cars is strong enough to drive any number of people to a great distance with the utmost speed."



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A. N. KELLOGG, Proprietor.

S. WRIGHT DUNNING AND M. N. FORNEY, Editors.

W. H. BOARDMAN, Acting Publisher.

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Editorial Announcements.

Address.—The RAILROAD GAZETTE will be printed for the present in New York; our printing house in Chicago having been destroyed. All communications, therefore, whether editorial or business, should be directed to the New York office. The proprietor will receive subscriptions and advertisements at his office in Chicago, Nos. 63 and 65 South Canal street, but letters should be addressed to New York.

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns our own opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

THE ILLINOIS RAILROAD COMMISSIONERS' REPORT.

Given a State with five thousand miles and more of railroad, forming an intricate system of whose history and management records are either altogether wanting or are imperfect and obscure; with these railroads a new code of laws, intending to regulate them, drawn up and enacted by men almost wholly ignorant of the principles of transportation—a code crude, contradictory, and in some parts, probably, altogether utterly impracticable; corporations regarding these laws as unfriendly and inquisitorial and in large part not merely of doubtful validity, but of unmistakable invalidity; with all these a commission of men who, whatever their ability or their special knowledge of railroad law, engineering or operation, certainly could not be able to comprehend at once the working of the railroad system of a State and its relations to the people, and the character, validity and effect of the code of laws aforesaid, which had scarcely been passed when they were appointed—given these circumstances and conditions, and we could hardly expect any very positive and definite result.

Such were the circumstances attending the service of the Board of Railroad and Warehouse Commissioners of the State of Illinois, whose first report to the Governor and Legislature we publish in this number of the RAILROAD GAZETTE. The Commissioners have not even had a whole year to work. The law went into effect July 1, and their report is dated December 1. Six months is too short a time for collecting the necessary statistics simply concerning the railroads of a State like Illinois, with anything like completeness and detail. It should not be surprising, therefore, if the report is not altogether satisfactory, in the sense that completeness is satisfactory.

The effect of the laws passed by the last Legislature, according to the Commissioners' report, so far has been chiefly this: imperfect reports from the corporations of the State concerning their roads. The companies deny utterly the validity of the laws restricting in any way their charges; in every instance where the rates prescribed by law for carrying passengers conflicted with the rates fixed by the companies, they have persistently

violated the law, so far without any other interference than a single suit brought by a citizen for overcharging; in their freight business, they have apparently similarly neglected to comply with the law, whenever it suited their convenience to violate it, and for this there has been a suit brought against one company by the Commission.

Now the testing of the validity of the freight and passenger laws passed by the previous Legislature is the most valuable service that can be done for the State. Certainly it is desirable to know whether such laws can be enforced before any other steps be taken in the same direction, that, if they prove unconstitutional, the State may seek some other method for the limitation of the power of the railroad corporations. But, probably enough, a large part of those who have sought for restrictive legislation, and who will watch the result of the operation of the laws and the acts of the Commissioners with most interest, will be disappointed with the first and disgusted with the last, and charge upon the Commissioners the failure, real or apparent, of the laws. This is the danger to which investigators are always exposed. While they seek for the truth—gather, compare and collate facts and draw conclusions, and thus lay the foundation for intelligent and effective action—the multitude complain that they waste time, amuse themselves and put off the public with idle speculations and statistics which at best are merely interesting, and cry aloud for immediate and positive action. This is especially true with such officials as State railroad commissioners. They are expected by the multitude to put an end to what the same multitude calls abuses in a complicated business of which it knows almost nothing, and which hitherto no laws under our American constitution have been made to restrain in the directions where restraint is most demanded, and this without study or investigation. Fortunately are they if the outcry of the ignorant and disappointed does not suddenly put an end at once to their investigations and their offices. In everything, of course, intelligent legislation must be based upon facts; and in any special subject, without the province or the view of the public, special effort must be made to procure and study the facts before intelligent legislation is at all possible. A commission which should spend three years in the study of so important and complicated a subject as transportation and its relations to the community, and in that time should only have succeeded in preventing the enactment and attempt at enforcement of absurd, mischievous or unconstitutional laws, such as were popularly demanded, and had demonstrated the worthlessness of such laws, would have done the State invaluable service, and really taken a great stride toward the desired reform, by withdrawing efforts in improper directions.

The Illinois Commissioners recommend that they be authorized to institute proceedings against railroad companies for violations of the act limiting charges for conveying passengers. The law now gives the passenger overcharged the right to bring action for the recovery of \$500, but so far only one or two persons have availed themselves of this right and no cases have been tried. It may be said that either the grievance suffered must be a light one or popular confidence in the validity of the law very weak if only so few out of many thousands have availed themselves of this law. Probably this is true, yet this is not necessarily the occasion of their neglect to prosecute. In every case, probably, the corporation would be very much wealthier than the prosecuting passenger, and would almost surely carry the case to the highest courts, necessitating expenses on either side which the recovery of \$500 would hardly begin to pay. The case is one which involves public rather than individual interests, and if it is to be prosecuted at all, it should be by the public, for whose benefit, in any case, the enforcement of the law would be made.

The same complaint is made with regard to the law limiting freight charges. Individuals are given the right to prosecute for the recovery of \$1,000 when they are overcharged under the law. The violations of this law have been comparatively not frequent; yet the cases must have been numerous, the amounts involved considerable, and the advantage of the enforcement of the law to individuals or firms frequently very material. The cause given by the Commissioners for the neglect of aggrieved parties to avail themselves of this law is their unwillingness to incur the enmity of a corporation with which they must have frequent important dealings, and which is able to injure them materially. This, doubtless, has had its effect; but we doubt whether there would not have been more than one man ready to prosecute the most powerful company if they had been convinced that the law would prove valid and the corporation could be compelled to obey it.

The Commissioners report most favorably on the condition of the older railroads of the State, which, indeed,

are now among the best in America, while the rolling stock of many is unexcelled in the world. They urge the advantage of platforms to passenger cars, which are in close contact when coupled (such as Miller's and Blackstone's), and suggest legislation requiring their use, arguing that the use of dining-cars, now not uncommon, has made it necessary, as it never was before, to pass from one car to another.

An interesting statement is made of the means generally adopted for obtaining capital for the construction of new railroads in the State—and, we may add, in most Western States at this time. The report asserts (as we have done in these columns not infrequently) that most of these railroads are constructed from money subscribed by municipalities and the sales of mortgage bonds almost exclusively, nothing or next to nothing being paid in on the stock subscriptions. That the large capital account thus formed has any appreciable effect on the tariff of the road, however, we do not believe; any more than that any more rent will be charged for a house because the owner may have made an exaggerated and fictitious statement of its cost. In both cases the proprietors will try to make the property as productive as possible, but will take very low prices if they cannot find customers at higher ones. There seems to be a very general impression that railroad companies are not permitted to divide more than ten per cent. annually on their capital stock. Such a law, we believe, does exist in Massachusetts; but so far as we know there is nothing to prevent any Illinois railroad company from making 100 per cent. dividends weekly—if it can get the money to divide. It is true that very large dividends are uncommon, and stocks making them are likely to be regarded as novelties and dealt with hesitatingly by capitalists, who are proverbially conservative; but if in any way the capital accounts of our railroads should be limited, they would not hesitate long to increase the percentage of their dividends.

The Commissioners recommend the enactment of a general law, by which railroads may be constructed anywhere in the State on complying with the law. Some general law will be necessary if there are to be any new railroad companies, as special legislation is prohibited by the constitution. But doubtless the supply of old charters still on hand will be sufficient for some time to come, as by many of them a railroad may be constructed almost anywhere in the State, by any imaginable route; but the owners of these charters will not be likely to hold them too dear should a law be passed by which any one may construct a railroad wherever he pleases, unless, indeed, they may happen to have special privileges, not granted by a general law. This general law, in the opinion of the Commissioners, should give a certain control and restrictive power to the State in all companies organized under it.

With regard to the present laws, the Commissioners suggest that the penalty of forfeiture of charter, imposed for any violation of law on freight rates, would be likely to be quite as much a punishment of the community as of the corporation, as there exists no legal method of operating a road except by the corporation owning it. The violation of this and of the passenger fare act they would have made an indictable offense, that private persons may not be depended upon for the enforcement of the law, but that duty be imposed upon the attorneys of the State. The law prohibiting rates for a given distance higher than for a greater distance on the same line meets their entire approval, and seems to them of great importance. They claim that it is of unquestionable constitutionality, and that it will do much to prevent the inequality of through and local rates or rates to competing and non-competing points, which in Illinois is more generally complained of than are rates absolutely high, as tending to build up terminal and competing points at the expense of all other places.

The law prohibiting rates higher than the rates for the same classes of goods and the same distances on the same line were in 1870 finds no favor with the Commissioners, being, as they show, often unequal, and providing no just standard.

As for the classification of the railroads of the State according to their gross earnings, on which the passenger fare act is based, they are unable to suggest any better basis; but the complaints of the violation of this act, such violation having been general, have been neither numerous nor bitter.

The report closes with the Commissioners' affirmation of their confidence in the constitutional right of the State to place the railroad companies under restrictions which are not specified in their charters—which the companies and their attorneys unanimously and confidently deny.

The reports from the railroad companies required by law, and which should form a most valuable part of the Commissioners' report, are less valuable than might be

expected, partly because of their imperfection—owing, in part, to their being the first, and in part, perhaps, to a disposition on the part of some companies not to give any more information than they thought best—and also and very largely because of imperfect arrangement and tabulation. One or two complete tabular statements would be very valuable. It is true, however, that the information must be complete from each company before a complete presentation of it can be made for all the companies.

RAILROAD ENTRANCES INTO CHICAGO.

Mr. John Harden, late a resident of Chicago, writes to us as follows concerning the best plan for railroads to enter Chicago:

"I think by far the most important improvement required by the city of Chicago is a plan by which it may be able to overcome the intolerable annoyance, depreciation of the value of real estate, and almost daily loss of life caused by the indiscriminate manner in which railroads enter the city. No plan should be entertained which would not conform to the convenience and interest of the majority of the railroads, nor should the interests of the railroad companies alone be considered, without regard to the welfare of the people of the city. Railways that enter a large city, for their own convenience and the welfare of all parties interested, should enter on a thoroughfare or channel uninterfered with by any other thoroughfare, and as exclusively as possible dedicated to their purposes. Among the railways that enter the city I find that the Chicago & Alton is about the only one that, from its course along the docks and by the lumber yards, warehouses and factories, rather adds to the value of the real estate along its way than otherwise, while it interferes less with the thoroughfares of the city than any other road. Along its course could be constructed a channel two hundred feet wide that would afford ample trackway for all the railways that enter the city from a south or southwestern direction. This trackway could be extended to the north side of Lake street between Canal street and the river, there entering and occupying for the purpose of a grand union passenger depot and transfer freight depots all the ground situated between the north side of Lake street and Kinzie and from the river to the east side of Halsted street. This ground is already occupied in part by passenger and freight depots and with very few other valuable buildings. The Northwestern Railway with its branches, not excluding the Galena Division and its other divisions that enter the city on Kinzie street, could enter the city on a similar trackway along the north branch of the Chicago River and occupy its present sites for its depots in connection with the other railways. The trackways, being laid on the original level of the city and in close proximity to the rivers, would make it less difficult to construct viaducts in connection with the river bridges. Whatever plan may be adopted to remedy this evil, the city will have to make the first move in that direction; for it cannot be expected that the railways will freely abandon their present trackways without the assurance of better accommodations.

Mr. Harden must remember that the reason why the Chicago & Alton and other railroads along the river are valuable to the property on their line is because, being on a level with the surface, side-tracks can be connected with them from the adjoining lumber and coal yards, manufactories, etc., while they could not be were the tracks sunk below or raised above the street level. The very cause which operates to make the passage of trains dangerous, and to delay passenger trains, is exceedingly desirable to the railroad as a freight-carrier, by very greatly diminishing the cartage of heavy products through the streets; for here we have, as it were, a depot at every man's place of business—a place at least where he can load goods at his own door and dispatch them thence directly to his customers. Imagine the 1,000,000,000 feet of lumber, which is shipped annually (chiefly by rail) from Chicago, carted through the streets from dock to depot. It would make probably half a million of loads, create unutterable and insufferable confusion in the streets, and add largely to the cost of handling this product. With coal it would be much the same, and so with some other less important matters. It would seem that the perfect railroad system should have tracks on the surface in all quarters of the city where heavy and bulky products are much handled—lumber, coal, ore, iron, grain, &c.—which should converge to the yards where trains are made up, and on which cars should be moved very slowly; and that both freight and passenger trains should leave and enter the city by tracks which have no level crossings—that is, which are either above or below the streets.

In the case of Chicago, for example, let us have all the lines enter the city from the west, through a sunken way as wide as may be necessary to the confluence of the north and south branches, or to any other point on the river. At that point establish the depots, and from these depots to the city limits have the railroad entrance absolutely unobstructed, the streets crossing the sunken way by bridges.

Then, to accommodate the elevators, lumber, coal, stone, lime and brick-yards, the furnaces, rolling mills and other manufactories of bulky and heavy goods, have surface lines running on either or both sides of both branches and the main stream, with branches to every adjoining yard and block where the occupants desire one. Some of these might serve wholesale merchants and have cars drawn by horses only: and thus a large part of the street traffic would be transferred to the railroads, to the manifest advantage of all concerned.

Some such plan, perhaps, would have been an excellent thing to have been adopted in Chicago in 1835 or thereabouts; but to make any radical change now, when an improvement of great value to the city, as a whole, may destroy millions in some locality, and when, too, the different companies have secured properties worth millions which a change may greatly depreciate, while at the same time adding millions to the value of property which they would be compelled to purchase after its value had been so raised—to make such a change now is so difficult as to be almost impossible. The way for it could hardly be made easy by anything less than another fire which should destroy the remaining portion of Chicago.

But the time will come, if it is not now, when the passenger trains must be kept off from the streets, either by crossings above or below grade, or by removing the depots to the outskirts of the city. Consider the case of New York, whose sole passenger station is removed more than three miles from what, doubtless, must still be termed its business center. Imagine Chicago with depots at Thirty-first street, Fullerton avenue, or Western avenue; this is something like the condition of New York (except for the stations across the Hudson), and yet the trains entering this distant depot have become so dangerous that the public is alarmed, and its representatives and the company's officers are considering plans for the promptest possible relief.

And scarcely less important is the limitation of the number of entrances into the city. Four parallel tracks, two for freight and two for passenger trains, with a complete signal system, will accommodate a very large number of trains, as many, probably, as now enter and leave Chicago on all its railroads, provided that they be used solely for trains already made up. Evidently the expense of costly engineering works to remove such an entrance from the level of the streets might easily be borne by four or five companies using it in common, while it might be quite overwhelming to a single corporation. The efforts which the authorities of Chicago are now making to secure certain definite lines by which all future railroads may enter the city, and to which they shall be confined, is praiseworthy; and it is to be hoped that as far as possible the existing rail road companies will avail themselves of the proposed combination for better facilities and thus relieve themselves and the city at once.

The Chicago, Pekin & Southwestern Railroad.

It will be remembered that one year ago this company had a rupture in its organization and elected a double directory, each faction claiming to be the only legal representative of the company, and each enjoining the other from exercising any of the functions of their office. Injunctions were multiplied, and many obstacles put in the way of the construction of the road, which, indeed, for many months was entirely suspended.

But in this, as in all other wars, one side must win. The fight was a hot one, but peace has been declared at last. All of the suits have been settled or withdrawn, and at the recent election held at Streator on the 9th instant, the result of which we give elsewhere, everything passed off quietly.

The design of the projectors of this road was to build a line of railroad from Chicago in a southwesterly direction through Plainfield, Marseilles, Streator and Washington to Pekin on the Illinois River, 165 miles from Chicago—a route passing through the finest portion of the fertile State of Illinois. It is now feared by those interested along the northern part of the line that the road may be stopped at Streator, and there connect with the Fox River Branch of the Chicago, Burlington & Quincy road. The election of Mr. F. E. Hinckley to the presidency of the company is ominous. Mr. Hinckley is well known as the President of the Chicago & Iowa Railroad Company, whose relations are very intimate with the Chicago, Burlington & Quincy Company, and he is also a director in the Ottawa, Oswego & Fox River Valley Railroad Company, which is now in fact a part of the Chicago, Burlington & Quincy, the line of which starts from Streator and makes quite a direct route to Chicago. By connecting the Southwestern with the Fox River Valley road at Streator, the building of the first 100 miles out of Chicago would be obviated, and a very good and short line from Livingston, Woodford and Tazewell counties to Chicago and a very desirable connection between the Peoria, Pekin & Jacksonville and the Chicago, Burlington & Quincy roads would be secured.

But if Mr. Hinckley's election is an ill omen to those who hoped for a new line into Chicago north of the Illinois River, it is an excellent omen to those who are interested in the speedy consummation of the company's plans by the completion of whatever they may have determined shall constitute their line. His energy has that peculiar element which sportsmen call "staying" qualities; and when he takes hold of an enterprise it is reasonable to count on its fulfillment.

Already we learn that six miles of the road from Pekin eastward to Groveland has cars running over it, and track-laying is progressing toward Washington and Streator, to which latter place it is intended to complete it very soon. If it should come into the possession of the Chicago, Burlington & Quincy, or that company should obtain running rights over it, it could easily connect it with its present line from Peoria to Galesburg, giving the latter line (now comparatively isolated) a direct connection with Chicago, and completing a "loop line" between Aurora and Galesburg.

The End of the North Missouri.

The proprietors of the railroad system of the North Missouri Railroad Company, recently sold to satisfy a class of the bondholders, have organized a corporation under the name of the "St. Louis, Kansas City & Northern Railroad Company." The names of the directors, which we publish elsewhere, indicate that the new company will have intimate relations with several connecting lines. Five of them are also directors of the Kansas Pacific Company, two of the Chicago & Alton, two of the "Pennsylvania Company," and three were members of the old North Missouri board. The Chicago & Alton already uses a part of the new company's road as a section in a line from Chicago to Kansas City; to the Kansas Pacific a friendly connection to St. Louis may be of great value, and the Pennsylvania, if reports are true, needs only a line from St. Louis to Kansas City to complete a route in which it has a powerful, if not a controlling, interest from New York to Denver.

The Eastern Terminus of the Northern Pacific.

In view of the hints—or something broader than hints—frequently made by rival towns, that the terminus of this road would not remain in Duluth, but would be established finally at Superior, Bayfield, or elsewhere on the lake, it is interesting to note that a contract has been made with the Lake Superior & Mississippi Company for the joint ownership of the latter's track between Duluth and the junction, 25 miles, over which heretofore the Northern Pacific has only had the right to run trains. This, it is reported, will be made a separate division, operated by an officer appointed and paid by the two companies.

It is further indicative of the purposes of the Northern Pacific that it has completed designs for docks at Duluth, which will have a frontage on the harbor of 16,140 feet, or a little more than three miles, and has placed a large engineering force at work on them.

Penalties for Neglect of Duty.

The Chicago Journal suggests that it be made a penal offense for any railroad employe to disobey orders or neglect his duty, and that all railroad companies be forbidden by law to employ any person who has once been convicted under the law. So if a brakeman should once "neglect his duty," by failing to call out the name of a station at any time, his usefulness in that career would be ended. But there are duties and duties; and the neglect of certain duties by a railroad employe is quite as dangerous as the sleeping of a sentinel at his post in time of war.

Free Passes.

The Lawrence Tribune reports that the fares of the "dead-heads" on the Leavenworth, Lawrence & Galveston Railroad, which is 173 miles long, during the year 1871, at regular rates would have amounted to more than \$80,000; *apropos* to which we may add that more than a hundred passes, most of them round-trip passes, over a line about 500 miles long, were issued on account of a single Western newspaper in one year, the total amount of which would probably have been something like \$2,000.

NEW PUBLICATIONS.

The Financier.—This, as its secondary title declares, is "a Saturday review of monetary interests and political economy." Financial journals—journals calling themselves such, at least—are not uncommon in America, and the appearance of a new one is not ordinarily an event worth noticing. They are too often, however, rather leeches of financial enterprises than journals of financial news and criticism. It is too early to say what value *The Financier* may have as a reporter of financial news, faithfulness, accuracy, freshness and fullness of which will do more than anything else to make it acceptable to those classes among whom it must find most of its subscribers. But its ability as an economical and financial critic is demonstrated most unmistakably in these initial numbers. The writing is evidently by experts, who are at least familiar with the laws of finance and political economy, have positive opinions, and

express them with admirable clearness. Such writing is certainly very much to be desired at this time, when financial and economical questions have assumed great importance, and when, it must be said, most people whose business it is to talk and write and act on such matters are a little more likely than not to get into a desperate muddle and blunder accordingly. To journalists especially the editorials of *The Financier* are to be recommended. They will find there information which they need (if they would not be blind leaders of the blind) and models of correct reasoning which they may imitate with advantage.

The Financier has 16 pages of a peculiar size (9½ by 13½ inches), is most beautifully printed, being one of the handsomest of American periodicals, and has in the number before us nearly ten pages of editorial matter, and a "money review" and price current covering about three pages. Quotations are given for each day in the week of prices bid for State, city and railroad bonds, railroad, bank and miscellaneous stocks, and United States securities. The paper is published at Nos. 156 and 158 Broadway, New York, by J. H. & C. M. Goodsell, who have now a well-deserved reputation as publishers by their successful management of that admirable insurance journal, *The Spectator*.

Chicago Railroad News.

Michigan Central.

The newspapers of this city have been discussing the subject of the removal of the general offices of the Michigan Central Railroad from this city to Detroit. The President, Chief Engineer and General Ticket Agent have always had their headquarters there; but for some years back the General Superintendent and General Freight Agent have had their offices in Chicago. Mr. Joy, the President of the Company, has been in this city for several days discussing this, as well as the depot question. The subject of the removal of the General Freight Agent's office of this road to Detroit has been talked over, and in view of the largely increased interests of the company in Michigan, by reason of the large amount of the lateral connections with the road in that State, amounting to something like 700 miles, it has been found necessary that the company should have some experienced man in Detroit to look especially after the interests of the company in that State. Although nothing has been fully decided upon, it is understood that the office of the General Freight Agent will be removed to Detroit.

Civil Engineers' Club.

The January meeting of the Civil Engineers' Club of the Northwest was held in this city on the 6th inst., a goodly number being in attendance. Col. F. W. Farquhar, of the United States Corps of Engineers, read an interesting paper on the methods in use in the survey of the Great Lakes. Mr. Charles Paine read a synopsis of a report of the recent experiments made by H. P. Stephens in regard to boiler explosions, and a discussion of the subject followed.

Illinois Central.

The Illinois Central Railroad Company is about to rebuild its land office building on Michigan avenue, north of Lake street. It will be a plain, four-story brick structure, and occupy the old site.

The charter of the Illinois Central Railroad Company requires it to report semi-annually its gross earnings, from which it pays 7 per cent. into the State treasury in lieu of taxes, etc. The report for the half year ending October 31 was laid before the Governor January 10, and is as follows:

Freights.....	\$2,645,699 13
Passengers.....	766,350 49
Extra baggage.....	1,346 40
Mails.....	38,250 00
Express.....	149,994 70

Total gross earnings.....\$3,593,540 32

In pursuance of law, 7 per cent. of the amount, viz.: \$251,677.82, has been paid into the State treasury.

The company will run a through train from Dunleith to Chicago over the Chicago & Iowa road, as soon as the arrangements for doing so can be perfected.

The Joliet Iron & Steel Company.

This company's manufactory at Joliet, which is now, and has been for some little time, in operation, is a Western enterprise worthy of note. It has been gradually growing until it has taken a position second to but one in the United States, that of the Cambria Company, in Johnstown, Pennsylvania. There has now been expended in and about the works for making iron and steel rails the sum of \$1,500,000, and the company is now prepared to turn out rails, either of iron or steel, in very large quantities.

At the annual meeting, a short time since, the following-named gentlemen were elected a board of directors: A. B. Meeker, J. H. Wrenn, George Greene, F. E. Hinckley, — Curtis, W. G. Neilson and I. A. W. Buck. The officers are: A. B. Meeker, of Chicago, President; F. E. Hinckley, of Chicago, Vice-President; J. H. Wrenn, Secretary and Treasurer. The company's engineer is Mr. P. Barnes, who entered their service a few months ago, after a journey of some months in England, where he had exceptional facilities for studying iron and steel works. The office of the company is at No. 376 Wabash avenue. It has just declared a five per cent. semi-annual dividend upon the stock.

A New Mississippi River Bridge.

Articles of incorporation have been filed at Springfield for the organization of the Mississippi Union Bridge Company. It is proposed by the company to construct a railroad and wagon bridge across the Mississippi at Clinton, near the Northwestern Railroad Company's bridge. The incorporators met last week and selected a Board of Directors consisting of the following-named gentlemen: C. H. Toll, Milo Smith, W. F. Coan, J. M. Walker, F. E. Hinckley, J. R. Graves and S. J. Kirk-

wood. The principal officers of the company are: President, C. H. Toll; Secretary, E. H. Thayer; Treasurer, W. F. Coan. It is proposed to proceed, at the opening of the season, immediately to the construction of the bridge. The capital stock of the company is \$1,200,000. It appears that the bridge is for the use of the Chicago, Burlington & Quincy and the Chicago, Clinton & Duquesne roads. In most cases the charters of such bridges require that all railroad companies shall be admitted to their use on equitable terms; but this, it is claimed, is not the case with the Northwestern's bridge at Clinton.

A New Consolidation.

The directors of the Bloomington & Ohio River and the Fairbury, Pontiac & Northwestern companies met a few days since and agreed upon a consolidation, and have advertised for 60 per cent. of the stock, according to the requirements of the State constitution. The consolidation will go into effect some time in March, when the combined line will go into working order under a new and strong administration. The Chicago office is at No. 504 Michigan avenue.

Chicago & Iowa.

The Chicago & Iowa Railroad Company has just completed a telegraph line from Aurora to Forreston, which is to be managed in the interests of the company, and entirely independent of any other telegraph company.

Crowded Grain Houses.

The Illinois Central "B" elevator is full of grain, with no means of shipment at present. The company have succeeded in storing several hundred bushels of grain in vessels lying in the harbor, but have now no further storage room, and so have been obliged to stop receiving grain. It is reported that most of the other warehouses in the city are almost full, there being 7,000,000 bushels in store, with storage room for only 9,000,000 bushels, while the receipts over shipments amount to 150,000 bushels daily. So Chicago will soon be obliged to stop receiving grain until the lakes are opened.

Ticket Agents' Meeting.

A meeting of the railroad ticket agents representing roads centering in St. Louis and Chicago was held in this city last week, to make some arrangements for cutting down the prices paid as commissions for selling tickets for the roads. The matter was discussed at some length without any final, definite action. The meeting adjourned to meet at the Southern Hotel in St. Louis on the 14th of February.

St. Louis to Keokuk.

A new through line, in connection with the Chicago & Alton road and the Quincy, Alton & St. Louis road, was opened on Monday, the 15th inst., from St. Louis, by way of Alton, Quincy, Burlington and Keokuk, to Fort Dodge, Iowa. Through trains run both ways.

Chicago & Alton.

The earnings of this railroad for the first week in January were as follows:

	1872.	1871.	Increase.
Earnings.....	\$83,004 05	\$82,307 49	\$796 56

The Mississippi, at St. Louis, is now open again.

Chicago, Burlington & Quincy.

For some years the railroad track of the Chicago, Burlington & Quincy Company, which crosses the Southern Division of the city near Sixteenth street, has been under discussion by the Board of Public Works, and plans have been devised for constructing viaducts over the track on State street, Wabash and Michigan avenues; but the plans, if favored by the railroad company, have been opposed by the citizens interested in the matter, and so nothing has heretofore been done. It is now stated by the Chairman of the Railroad Committee of the Common Council that this company will agree to sink its track, from the river to the lake, to a depth of eight feet, which will only require comparatively low viaducts to be constructed over the streets crossing the track. It is understood that the city and the company will mutually agree to a plan substantially as above stated, which will be of advantage to both parties.

Chicago & Northwestern.

There was almost a corner in the preferred stock of this company on Wall street last Monday, and it sold up to 99½. It is said that nearly three-fourths of it is held in Europe, while a considerable part is held for investment outside of New York, and is not likely to be offered on the street even at such a price as that named.

The company has been offered \$200,000 to construct the Madison extension directly into La Crosse before joining the "Winona Eastern Connection," which has its southern terminus a few miles northeast of that city. But on account of the heavy grades and increased cost of construction by this route it has been decided not to adopt it; and an entrance into La Crosse will be made by a short spur, probably along the Milwaukee & St. Paul from the junction.

Common Railroad Entrances into Chicago.

A conference of the railroad officials representing roads centering in this city, together with the Railroad Committee of the Common Council, was held in this city on Friday last, for the purpose of determining upon some plan by which new railroad companies desirous of entering the city may do so without the delay, inconvenience and cost of purchasing the right of way into the city, a thing which, as matters have heretofore stood, has been equivalent to the prohibition of new roads. The city is now desirous of welcoming all new roads, from whatever direction they may come, and the municipal authorities are disposed to remove all obstacles to the establishment of new railroad connections with the outside world.

It is said that there are 15 new roads desirous of entering this city. To accommodate these, it is proposed by the committee to open at least two railroad thoroughfares, open for all new roads, upon the payment of a fair share of the cost of opening such thoroughfares. The ideas of the committee are, that one roadway, about a block in width, shall be opened along the east side of the North Branch to accommodate roads entering the city

from the north and northwest. They propose also to establish another thoroughfare somewhere south of Twelfth street, for western and southwestern roads, and perhaps for eastern roads, although there is some talk of making another roadway along the east side of the South Branch of the river to accommodate these roads.

The result of the preliminary conference is that another is to be held on the 19th inst., after which the committee will report a plan to the council. This plan will be substantially that the city will abandon or vacate a street on one of the proposed thoroughfares, and then will either condemn or cause to be condemned the property on either side for half a block in width, which will make a roadway of about 400 feet in width. The cost of opening the thoroughfare is to be paid to the city jointly by all the railroad companies that may use the thoroughfare. When three companies, for instance, have jointly paid for the right of way, a fourth company shall be admitted, upon its paying one-fourth of the whole cost of right of way, which is to be divided back among the original railroad owners of the way.

The committee seem to be in earnest about the matter, and it is quite probable that something will shortly be done which will enable any new company to enter Chicago with small cost for the right of way.

Among the prominent companies now asking for the right of way are the Baltimore & Ohio, Atlantic & Pacific, Chicago & LaSalle, Chicago & Evanston, and Chicago, Danville & Vincennes.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

—At the late annual election of the Little Rock & Fort Smith Railroad Company the following gentlemen were chosen officers: Charles G. Scott, President; A. McDonald, Vice-President; Gordon Peay, Secretary and Local Treasurer; J. H. Harvey, Chief Engineer; Asa Hodges, Superintendent; and C. G. Scott, Henry Page and A. McDonald, Executive Committee; A. H. Garland, Attorney. A resolution was passed declaring Fishbert's contract null and void, and authorizing the Executive Committee to assess damages for delay in construction and make a new contract for the completion of the road.

—At the annual general meeting of the British Institution of Civil Engineers, held December 19, Thomas Hawksley was chosen President; Joseph Cubitt, Thomas Elliott Harrison, George Willoughby Hemans and George Robert Stephenson, Vice Presidents; James Abernethy, Sir William George Armstrong, C. B., Wm. Henry Barlow, John Frederic Bateman, Joseph William Bazalgette, C. B., Nathaniel Bearmore, Frederick Joseph Bromwell, George Barclay Bruce, James Brunlees, Charles William Siemens, Sir Joseph Whitworth, Bart., and Edward Woods, members; Isaac Lowthian Bell, Henry Bessemer and William Cawkwell, associates.

—At the annual meeting of the stockholders of the Vicksburg & Brunswick Railroad Company, held in Eufaula, Ala., December 13, four-fifths of the stock being represented, the following named gentlemen were elected directors for the ensuing year: E. S. Shorter, W. A. Bray, L. F. Johnson, H. D. Clayton, W. Clark, B. Morris, A. C. Russell, B. B. McKenzie, John Gill Shorter, Thomas Cargile and W. H. Crenshaw; and at a meeting of the directors held subsequently Hon. Eli S. Shorter was re-elected President, and J. M. Macon, Secretary and Treasurer.

—At an election held at the banking house of Wallace Cumming & Co., in Savannah, January 1, the following gentlemen were elected as directors of the Augusta & Savannah Railroad Company for the ensuing year, viz.: A. R. Lawton, William Duncan, R. A. Allen, John Davison, Wallace Cumming, George S. Owens and John L. Hardee. At a subsequent meeting of the Board, Wallace Cumming was elected President.

—On the 10th instant, the stockholders of the Little Schuylkill Navigation & Coal Company held their annual meeting at their office, No. 410 Walnut street, Philadelphia. The following named gentlemen were elected officers for the ensuing year: President, John F. Blandy; Managers, A. E. Borie, A. J. Derbyshire, S. J. Reeves, D. R. Bennett, J. H. Trotter, S. F. Ashton; Treasurer and Secretary, Joseph Lapsley Wilson.

—At the annual election of officers of the Chicago City Railway Company, held January 11, the following were chosen for the ensuing year: President, M. D. Hennessy; Vice-President, Daniel A. Jones; Treasurer, J. F. Johnson; Superintendent, R. T. Crain. The Directors are Albert Crosby, S. B. Cobb, Daniel A. Jones, Samuel W. Allerton, J. P. Brooks, Samuel Johnston and M. D. Hennessy.

—Ashbel Welsh, Esq., late President of the United Companies of New Jersey, has been officially notified of his appointment as Engineer-in-Chief of lines of the united companies, and has specially given to him in charge the costly improvements contemplated at Harsimus Cove.

—At annual meetings of stockholders held in Philadelphia, January 8, the following directors were chosen: Philadelphia & Darby.—President, S. Gross Fry; Vice President, Charles Thompson; Directors, S. Gross Fry, J. P. McFadden, Charles Thompson, C. Colket, C. D. Norton and A. L. Bonafon.

Mifflin & Centre County.—President, J. Edgar Thomson; Directors, J. Edgar Thomson, Joseph B. Myers, Josiah Bacon, Edmund Smith, Wistar Morris, John M. Kennedy, H. J. Lombard, J. B. Roberts; Jas. H. Mann, Lewistown; Samuel McClay, Milroy; George W. Elder, Lewistown; Thomas A. Scott and Samuel T. Bodine.

Western Pennsylvania.—President, J. Edgar Thomson; Secretary and Treasurer, Joseph Lesley; Directors, J. Edgar Thomson, Samuel T. Bodine, Wistar Morris, Edmund Smith and H. J. Lombard.

Chester Valley.—President, John F. Gilpin; Directors,

Franklin B. Gowen, Coffin Colket, Charles E. Smith, H. P. McKean, R. B. Cabeen, A. E. Borie and William H. Holstein.

Chestnut Hill.—President, C. Colket; Secretary and Treasurer, H. C. Colket; Directors, Joseph Patterson, W. L. Shiffer, H. M. Phillips, William Miller, F. B. Gowen, E. H. Weil, H. K. Smith, W. W. Colket, A. E. Dougherty, W. S. Wilson, A. B. Eckel and Charles H. Gross.

Philadelphia Commercial Wharf & Railroad Company.—President, Titus S. Emery; Directors, Titus S. Emery, George Sturges, H. N. Guernsey, M.D., H. H. Shillingford, George P. Fitts, Horace P. Wilbur, Frank B. Hubbell, H. Ryland Warriner and Henry T. Shillingford.

Philadelphia & Montgomery.—President, H. G. Sickel; Directors, Alfred Blaker, Isaac Eyre, Robert F. Johnston, B. J. Smith, Isaac H. Hilborn and Charles Williard.

Columbia & Port Deposit.—President, J. Edgar Thomson; Secretary and Treasurer, Joseph Lesley; Directors, J. Edgar Thomson, Josiah Bacon, J. D. Cameron, Philip Gossler, Maris Hoopes, William J. Howard, C. S. Kauffman, H. J. Lombaert, Wistar Morris, Joseph B. Myers, Thomas A. Scott, Edmund Smith and Jacob Tome.

Port Kennedy, Allentown & East Mahanoy.—President, Franklin B. Gowen; Managers, H. Pratt McKean, A. E. Borie, R. B. Cabeen, J. B. Lippincott, John Ashurst and Chas. E. Smith.

Bedford & Bridgeport.—President, John Cessna; Directors, John Alsip, George W. Anderson, Josiah Bacon, John G. Hartley, Jacob P. Jones, John M. Kennedy, John W. Lingenfelter, Isaac Mengel, George B. Roberts, E. Y. Townsend, L. T. Watson, George R. Wood; Secretary, M. A. Points; Treasurer, John S. Bowers.

—The newly-organized Verona, Cassville & State Line Railroad Company of Missouri has chosen the following directors: R. H. Green, G. A. Purdy, J. M. Crammer, N. S. Claridy, J. M. Gregory, T. W. Ham, J. W. Hansard, Verona; Chas. S. Bryan, John H. Moore, W. S. McConnell, Jos. Cravens, J. P. Waldon and John Ray, of Cassville.

—The stockholders of the Chicago, Pekin & Southwestern Railroad Company held its annual meeting for the election of directors at Streator, Ill., on the 9th of January, 1873. The newly-elected board consists of James L. Stark, F. E. Hinckley and P. B. Shumway, of Chicago; David Strawn, of Ottawa; Samuel Plumb, Jay Baker, A. E. Tyler and F. Plumb, of Streator; Cragie Sharp, of Minonk; W. A. Ross and J. W. Dougherty, of Washington; B. H. Harris, of Groveland, and W. W. Sellers, of Pekin. The board organized by electing F. E. Hinckley, President; James L. Stark, Vice-President; Samuel Plumb, Treasurer, and F. Plumb, Secretary. The Executive Committee consists of the President, Vice-President and Secretary. C. W. Allendorph was appointed Chief Engineer.

—At a recent meeting of the Piedmont & Potomac Railroad Company (which designs the construction of a railroad from Washington westward to Aldie, about half-way between the Washington & Ohio and the Manassas Gap roads, and thence southwestward to Luvray) the following directors were elected for the ensuing year: Charles H. Sherrill, of Washington, D. C.; Aaron L. Reid, of New York; Effington B. Sutton, New York; Richard S. Cox, of Virginia; James A. Magruder, of Georgetown, D. C.; and Eugene Kelly, of New York. Charles H. Sherrill was chosen President.

—Col. William B. Gaw has been appointed Chief Engineer of Docks of the Northern Pacific, in charge of the works at Duluth. George F. Bailey is Assistant Chief Engineer, and C. G. Franklin, George Nelson and Edward H. Foster are assistant engineers.

—At the recent election of the Terre Haute & Indianapolis Railroad Company (which operates the line from Indianapolis via Vandalia to St. Louis) President W. R. McKean was re-elected; W. H. Buckingham, of St. Louis, late of Terre Haute, was chosen Secretary, in place of R. A. Morris, resigned; J. H. Hager, late Paymaster, was chosen Treasurer, in place of M. W. Williams, resigned; and M. S. Durham was chosen Auditor, in place of R. A. Morris, who was Auditor as well as Secretary.

—The North Missouri Railroad Company, reorganized as the "St. Louis, Kansas City & Northern Railroad Company," has chosen the following new board of directors: T. B. Blackstone, Chicago (President of the Chicago & Alton Company); John J. Mitchell (Director of the Chicago & Alton), Alton, Ill.; Thomas A. Scott, President, and J. N. McCullough, General Manager, of the "Pennsylvania Company"; Robert E. Carr, President, and Adolphus Meier, Vice-President of the Kansas Pacific; Solon Humphrey and John A. Jamison, New York; James H. Britton, James B. Eads and William M. McPherson (directors of the recent North Missouri board), of St. Louis. This indicates that the road will be managed harmoniously with the Pennsylvania on the east, the Kansas Pacific on the west, and the Chicago & Alton on the northeast, with which, indeed, its connections are naturally intimate. T. B. Blackstone, President of the Chicago & Alton Company, and an accomplished railroad officer, thoroughly skilled in the operation of railroads, is the new President; James F. How was chosen Secretary; and Jacob N. McCullough, Robert E. Carr, W. M. McPherson and J. J. Mitchell, Executive Committee.

—O. H. P. Archer, for some years a director of the Erie Railway Company, has been chosen Vice-President of that company in place of James Fisk, Jr., deceased. The office of Comptroller, held by Mr. Fisk, has been abolished, and an Auditing Committee, composed of Henry Thompson, Horatio N. Otis and John Hilton, takes its place.

—The following were chosen directors of the Pana, Carlinville, Carrollton & Clarksville Railroad Company at the annual election in Alton, Ill., December 28: W. E. Hayward, G. P. Lawrence, Pana; C. W. Weer, Carlinville; John H. Rives, Fayette; Jacob Bowman, David

Wright, George Wright, John I. Thomas, L. S. Eldred, Robert Pierson, H. L. Clay, Carrollton; John O. Roberts, Clarksville. The following officers were chosen: Jacob Bowman, President; L. S. Eldred, Vice President; H. L. Clay, Secretary; Robert Pierson, Treasurer; Hon. A. G. Burr, Attorney; officers of the company and John I. Thomas, Executive Committee.

—The old board of the Boston, Lowell Company was re-elected at the annual meeting on the 9th: These are F. B. Crowninshield, J. G. Abbott, William Minot, Jr., and Henry W. Codman, Boston; Hocum Hasford, Lowell.

—At the annual meeting of the Detroit, Hillsdale & Indiana Railroad Company, held at Hillsdale, Mich., January 9, the following directors were elected for the ensuing year: C. H. Buhl, J. F. Joy and John Owen, of Detroit; William Waldron and E. L. Koon, of Hillsdale; D. L. Kirk, of Ypsilanti; E. Smith, of Boston; J. D. Corey, of Manchester; Benj. Fisher and W. H. D. Davenport.

OLD AND NEW ROADS.

Louisville, New Albany & St. Louis.

A correspondent writes as follows of this line:

"This road, running in a direct line from New Albany to St. Louis, is rapidly nearing completion. From New Albany to Princeton it is located through a broken and hilly country. At Princeton it connects with the Evansville & Crawfordsville road, and is now in operation to Mt. Carmel, Ill. At this place it will cross the Wabash River by a bridge 1,320 feet long, having a draw of 230 feet. Prescott, Dewey & Co., the contractors, have in a marvelously short time accomplished a great deal of work, proving the old maxim, that 'knowledge is power.' Col. John C. Prescott and Austin C. Dewey, of this firm, are veteran railroad constructors and self-made men. They have both been well and favorably known for the past twenty years, and by their energy, industry and long experience, have made a reputation for their firm not excelled by any in the same line of business.

"West of Mt. Carmel this road is located through a fine and well-settled agricultural country, intersecting the main lines of railroads in Southern Illinois. It will open up a portion of 'Egypt' never before in railroad communication with any of the lines leading to commercial centers. The iron is now being laid in Illinois."

Memphis & Charleston.

The proposition to lease this important Southern railroad was made by the "Southern Railway Security Company," which offers to lease the property for 99 years and guarantee dividends at the rate of 3 per cent. for five years, and 6 per cent. thereafter.

"Southern Railway Security Company."

This is the title of a corporation whose headquarters are in Pittsburgh, which is going about the South seeking what (in the way of railroads) it may devour, acting apparently for the Pennsylvania Railroad Company in that section as the "Pennsylvania Company" does in the West. George W. Cass, President of the Pittsburgh, Fort Wayne & Chicago Railroad Company, is President, and Thomas A. Scott one of the directors and managers.

Southwestern Construction Company.

A company, with this name, has been organized in Kansas City, for the general purpose of undertaking contracts for the construction of railroads and other public works. The authorized capital is \$2,000,000. William H. Russell is President, Howard M. Holden Treasurer, John W. Polk Secretary, and P. H. Thomson engineer.

St. Louis & Iron Mountain.

The earnings for December were:

1871.....\$169,607 1870.....\$119,073 Increase.....\$50,534

And for the year:

1871.....\$1,543,768 1870.....\$1,347,538 Increase.....\$196,230

This is an increase of 41 per cent. for the month and 22 per cent. for the year. Excluding the portion of the road constructed during the past season, which has hardly commenced to do business yet, these earnings are at the rate of \$7,950 per mile.

Union Pacific.

The General Superintendent reports by telegraph that the December traffic was \$535,000, subject to extra expenses (\$45,000 in amount) for clearing the track in December and providing against obstructions in January. The receipts were:

Gross for December.....\$535,000

Expenses and extra expenses.....351,009

Net earnings of month.....\$183,991

There has been complaint that there was not sufficient effort made by the company to keep its road open during the storm which recently obstructed the line for a period of two weeks, but as the loss was much greater to the company than to any (probably all) of its patrons, and it is well officered and has given proof heretofore of efficient management, this is not easy to believe; though it is unquestionable that a road with no more trains and no larger staff of employees than the traffic of this line requires is much more easily obstructed by snow than a line which has a train every hour or two to clear away the snow, and consequently a very large staff which can be mustered on occasion to remove any extraordinary obstacle.

This company has an officer called General Town-Lot Agent, Mr. J. M. Eddy, who reports the number, kind, cost and location of buildings within an area of two miles at each station on the Union Pacific during the year 1871. According to this report, at the 34 stations reported there were constructed a total of 1,273 buildings, at an aggregate cost of \$1,798,810. More than one third of these were in the single town of Fremont (47 miles from Omaha), which is credited with 456. Laramie has 73; Corinae, 70; Lone Tree, 67; Columbus, 60; Evanston, 57; and Gibbon, 50. Of the whole number of buildings, 847 were dwellings, 19 hotels, 17 school-houses, 29 churches, 40 offices, 7 banks, 9 public halls, 4 court-houses, 8 jails,

42 storehouses, 114 stores, 10 livery stables, 7 breweries, 48 saloons, 2 mills, 14 shops, 9 railroad structures, 21 tenement-houses, 3 eating-houses, 3 ice-houses and 22 miscellaneous.

European & North American Land Claims.

In his recent message the Governor of Maine says:

"The report of the Land Agent calls attention to the claim of the European & North American Railway Company to certain lands set apart for settling purposes and the timber thereon.

"The report states that 'by the act of 1864, chap. 401, to provide means for the defense of the northeastern frontier by aiding the construction of the European & North American Railway, upon certain conditions it was made lawful for the Governor, State Treasurer and Land Agent to transfer to said company all the public lands lying on the waters of the Penobscot and St. John River for the uses and purposes set forth in the act, provided, however, that there shall be excepted from said conveyances and from the operations of this act all lands set apart and designated for settlement under existing laws.' By a subsequent act of 1868, chap. 604, the preliminary conditions of the first act above cited were repealed, and the Governor of the State was thereby authorized and empowered to transfer and convey to the European & North American Railway Company all the timber and lands belonging to the State situated upon the waters of the Penobscot and St. John River, to be used by the company to aid in the construction of its line of railway, as contemplated and provided for in the foregoing act, subject to all reservations contained in the obligations imposed by said act.

"Under the authority of this act the Governor made a deed to the corporation on the 13th day of May, 1868, the effect of which depends upon the construction of the act authorizing it. Under and by force of these several acts, resolves and deed, the railway company now make claim to all the timber on all the lands belonging to the State at the time, situated on the Penobscot and St. John waters, including those set apart as aforesaid for settlement, and also claim that as to most, if not all the lands so set apart, certain irregularities or deficiencies exist in the proceedings, whereby the exception of 'all lands set apart and designated for settlement under existing laws,' is rendered unavailing, and that, therefore, the grant conveyed to the company all the settling lands not already conveyed to settlers.

"In pursuance of this claim the company have put in a defense, and therefore resist the proceedings commenced under Resolves of 1870, chap. 168, for the portion of townships No. 17 and 18, range 7, being Fort Kent and Wall-grass townships, which proceedings have for this cause been arrested; and have also granted permits to cut timber on townships No. 11 range 3, No. 18 range 3 and No. 8 range 5, west from the east line of the State, all of which townships are among the number set apart as aforesaid for settlement. The parties permitted on townships No. 11 range 3 and No. 8 range 5, having commenced operations under their permits, the Land Agent at once laid the matter before the Governor and Council, and notice has been given to the parties that they will be regarded as trespassers and treated accordingly if they persist in their operations, as it is understood they are doing.

"Legal proceedings will immediately be taken to protect the rights of the State in these lands and the timber thereon."

The Governor of Maine on Railroads.

In his recent message, Hon. Sidney Perham, Governor of Maine, has the following paragraph:

"Commendable progress has been made during the past year in the extension of our railroads, with a fair prospect that this work, so essential to the development of our resources, will continue to go forward. Several new roads are being projected, including one greatly needed connecting the counties of Hancock and Washington with Bangor. The new roads extending west from Portland will, at no distant day, give us more direct and cheaper transportation to and from the grain growing States of the West. The opening of the European & North American Railway makes a connection with St. John, soon to be extended to Halifax. This will unite the people of this State and the Provinces in closer social and business relations, and cannot fail to benefit both. This road touches the southern portion of Aroostook County, and I trust the extension of a railroad into the heart of the county will be accomplished in a few years. The rich lands of this county only wait for railroad communication to secure their settlement by an industrious population and yield a large income to the owners and become a source of wealth to the State.

"Our neighbors in New Brunswick, with a zeal and forecast worthy of great praise, are preparing to construct a railroad that will pass for a long distance near the easterly and northerly lines of Aroostook County, with the view of gathering the rich surplus products of all the northern part of the county, and transporting them to St. John. And this they will do unless our people bestir themselves and give that section of the State an outlet this way.

"The Railroad Commissioners make some important suggestions relating to the management of railroads. Their suggestion in regard to the manner in which they receive their compensation is especially entitled to consideration. There are, it appears to me, serious objections in making a public officer dependent for compensation upon a corporation, of which a proper discharge of his duties requires that he should be entirely independent."

Savannah, Skidaway & Seaboard.

This railroad, which is a city and suburban line extending from Savannah southeastward to points on the sea coast, has been leased to William McRae & Co., who commenced operating it on the 1st inst.

Chicago, Pekin & Southwestern.

The laying of the track on the southern portion of this line, from Pekin northeast to Groveland, about six miles, was completed on the 30th of December. Col. R. Plumb

the chief contractor, reports that everything for the early and successful completion of the line has been provided for. Track-laying is steadily progressing from the southern terminus at Pekin, northwards towards Washington. Savannah & Memphis.

Mr. Thomas R. Sharp, the Superintendent, writes us that this road is now in operation to Slaughter's Station, Ala., 25 miles northwest of its terminus at Opelika, on the Montgomery & West Point road. It is to be opened to Dadeville, 30 miles from Opelika, in March; to the Tallapoosa River, 40 miles, in May, and to Youngsville, 55 miles, by November.

The Hoosac Tunnel.

Concerning this work and the railroad which will pass through it, Governor Washburn speaks as follows in his recent message to the Massachusetts General Court:

"The Hoosac Tunnel enterprise has been prosecuted diligently during the past year, and the work is now progressing to reasonable satisfaction. Although up to this date the Messrs. Shanly have not made their full advance for which the contract with them stipulates, it is believed their facilities are such that they will be able to finish the tunnel by March, 1874, the limit of time specified in the contract for its completion. When they assumed management 9,341 feet had been opened; to the first of last month they had advanced the work by 7,737 feet, and there then remained 7,953 to complete the undertaking. But as they have completed the central shaft and are now working from four instead of two faces, we have every warrant for expecting much more rapid progress in the future than has been made hitherto. The net expenditure by the State for the tunnel and the Troy & Greenfield Railroad up to December 31, 1871, exclusive of the interest account, was \$6,335,332.30. It is highly gratifying to those who from the first have been earnest advocates of this great enterprise to know that its ultimate and speedy completion is beyond doubt or dispute. It can no longer be looked upon as a financial blunder necessarily bringing large loss to the Commonwealth. It may to-day be considered a grand success—whether viewed as a triumph of untiring energy and masterly engineering proficiency, or as the opening of a great thoroughfare by the shortest route to the magnificent granary of the West and Northwest.

"What is to be done with this railway when it is completed—whether it shall be sold outright if a satisfactory price is offered, leased to some other road or roads for a term of years, or retained and operated by the State, are questions of much importance to our people. The execution of the vast project has cost so much of time and thought and money and patience, that we cannot easily be over-zealous in regard to its future, nor can we afford to lose any of the benefits legitimately to be derived therefrom. That the State itself can manage a railroad more economically, or so as to serve the public better, than private corporations, is contrary to all our experience. As long as political parties contend for mastery, and the spoils are claimed by the victors, we must refrain from committing the management of our railways to the Commonwealth, and leave it to associations of persons who are held responsible to the State for the faithful discharge of their trusts. But whether this Troy & Greenfield road be sold or leased, the State should never entirely relinquish control of the same. The enterprise was undertaken as a means to gain cheaper and quicker communication with the West. We must see that this end is realized, not only by our chief city and that portion of the State contiguous to the line of the road, but also by those sections more directly tributary to other roads intersecting this great thoroughfare. If by legislation we can afford equal opportunities to each of these intersecting lines, they in turn will distribute the same to the people of their respective neighborhoods. Thus, and thus only, by giving and maintaining equality of right and privilege to all connecting roads, can the State at large derive the benefit it should from the completion of the tunnel."

Rome & Clinton.

Trains commenced running regularly on this new railroad on the 15th inst. It is leased and operated by the New York & Oswego Midland. It is 13 miles long.

Utica, Clinton & Binghamton.

This road, formerly extending from Utica southwest to Clinton and Whitesboro, 13 miles, and operated by horse power, was transferred on the 13th inst. to the New York & Oswego Midland, having been extended 15 miles to a junction with that road at Smith's Valley.

Cincinnati Southern.

The lower house of the Kentucky Legislature has passed a bill for a charter to this company by a vote of 59 to 38. The chief struggle will be in the Senate, but it is reported that there is a good prospect that it will pass it.

St. Louis & Keokuk.

The North Missouri Construction Company is the name of the organization which has taken the contract for constructing this road. Maj. S. Dwight Eaton is engaged as engineer and superintendent of construction, and it intends to complete the road from Hannibal down the west bank of the Mississippi through London, Louisiana and Clarksville, and across to the St. Louis, Kansas & Northern (late North Missouri) road at Dardennes, by the close of the year.

St. Louis, Alton & Terre Haute.

At a regular meeting of the holders of the preferred stock of the St. Louis, Alton & Terre Haute Railroad Company, held last week, resolutions were passed recommending the directors to settle the arrears of 1869, 1870 and 1871 by declaring a dividend of 21 per cent. in preferred stock at par for the three years, unless the resources of the company at the present time will admit of the payment of the last year's dividend of 7 per cent. in cash. This proposition must be sanctioned by the bondholders, according to the terms of the mortgage agreement, and a meeting for that purpose was held on the 17th.

Lake Shore & Michigan Southern.

It is reported that the net earnings of this road for the year 1871 will show net earnings equivalent to 9½ per cent. on all the capital stock, after paying all expense and interest. The dividends were at the rate of 8 per cent.

New York Central & Hudson River.

The report to the State Engineer for year ending September 30, 1871, shows the gross receipts to have been \$22,201,521; the operating expenses, \$13,991,110 (65 per cent.); the net earnings, \$8,210,411. The 8 per cent. dividends on stock amounted to \$7,258,741, and the interest on bonded debt to \$721,308, leaving a surplus of \$230,362—a little more than double the entire net earnings of the Erie.

During the year \$451,088 of the old bonded debt of the New York Central was extinguished by the sinking fund and \$2,000,000 of Hudson River bonds were extinguished by an issue of new bonds by the consolidated company. The total bonded debt at the close of the year was \$15,213,719; and the capital stock and scrip, \$89,428,330.

Compared with the previous year, the earnings show a decrease of \$161,798—about 2 of 1 per cent.—and the expenses a decrease of \$76,869. The earnings are at the rate of \$26,367 per mile, including branches.

Milwaukee & St. Paul.

The new railroad from Milwaukee to Chicago, which this company is constructing parallel with and a very short distance from the Chicago & Northwestern's line, is built in Wisconsin under the charter of the "Wisconsin Union" Company, and in Illinois under that of the "Northern Railway of Illinois." Grading is completed for about 14 miles from Milwaukee southward, and it is announced that the entire line is to be completed by the end of the current year.

Atlanta & Richmond Air Line.

A correspondent writes from Greenville, S. C., that the grading for this road is nearly completed between that place and Charlotte, N. C., its northeastern terminus.

Burlington & Missouri River.

A branch of this road from Charlton (130 miles west of Burlington) southwest to Garden Grove, 22 miles, was to be completed on the 3d inst., and opened for business on the 8th.

Atchison & Nebraska.

It is proposed to construct a branch of this road from Rulo northward along the Missouri River. The fate of the scheme depends upon the disposition of the river towns to aid it.

Missouri, Kansas & Texas.

The contract for the northern extension of this railroad, from Sedalia through Boonville to Moberly, Mo., which will be made under the charter of the Tebo & Neosho Company, was let on the 28th ult. The section between Sedalia and Boonville was let to L. E. Post & Co., and that from Boonville to Moberly to Rymer & Elliott. The former is to be ready for the iron within four months.

The construction of the line to Moberly, together with the fact that the Missouri, Kansas & Texas is not represented in the reorganized North Missouri, indicates that the combination made last summer and apparently fully agreed upon, by which the Chicago & Alton was to become the Chicago outlet and the North Missouri (now St. Louis, Kansas City & Northern) the St. Louis outlet of this road, has been broken up or has failed of completion.

Hannibal & St. Joseph.

It is reported that this company will endeavor, with the help of the country interested, to construct a branch from Monroe, which is 30 miles from Hannibal, southeast to St. Louis, thus giving it an independent entrance into St. Louis. This would be a line nearly parallel with the Mississippi and about 20 miles from it. It would give the Hannibal & St. Joseph a very direct line to St. Joseph, but not to Kansas City. The general offices of the company, recently in Boston, have been removed to New York, and are there established at No. 78 Broadway.

Griffin, Monticello & Madison.

Of this new Georgia railroad ten miles, from Griffin eastward, is graded and work is continued. The primary design, which was to make it a narrow-gauge road, has been abandoned, and it will have the five-foot gauge common in the South.

Railroad Aid in Missouri.

A bill has been introduced into the lower house of the Missouri Legislature which provides for an issue of \$10,000 per mile in State bonds for every mile of railroad constructed in the State, which is to receive 2 per cent. of the gross earnings to pay the interest and create a sinking fund for the payment of the bonds. As there is but one railroad in the State whose gross receipts are as much as \$10,000 per mile, it will not be strange if the sinking funds do not grow very fast after payment of interest. But such a law would be an excellent thing for contractors.

Memphis, Carthage & Northwestern.

Mr. J. B. Polky, Chief Engineer, writes to us that this company on the 10th inst. had just finished grading 27 miles, between Pierce City, on the Atlantic & Pacific road, and Carthage, passing through a rather rough country, all in a short time over 60 days. He adds that track-laying was to commence on the 15th inst., and that an additional 50 miles, extending west, will be let as soon as the location can be made in the coming spring.

Northern Pacific.

A correspondent of the St. Paul Press speaks as follows of the new docks at Duluth, the construction of which this company has recently commenced:

"These huge structures are to be of really gigantic proportion, with three immense warehouses, where eighteen vessels can load or unload at the same time. The engineers report a depth of sixteen or eighteen feet, in-

cluding more or less soft material at the bottom that can be easily dredged out or run through the canal into Lake Superior, whither the current seems to tend."

The company has given a contract for the construction of several hundred cars to Schönberger & Bryant, of the Duluth Iron Works, who hope to complete 100 during the winter.

It is reported that there is trouble between the railroad company and the Northwestern Construction Company, which had the contract for constructing the line across Minnesota. It is also reported that "an unusually interesting development is likely to be made public in reference to sharp practice in forming a new construction company and in getting the Dakota contract."

Omaha & Southwestern.

An extension of this road from Beatrice westward up the Republican Valley is designed, and surveys have been made for it for more than a hundred miles.

Chesapeake & Ohio Railroad.

The Richmond Whig says: "The residents on the Peninsula are exercising themselves very much over the subject of a railroad terminus of the Chesapeake & Ohio Railroad. The residents of Newport News favor their place as a grand objective point, and the residents of Yorktown favor their locality. We can now state authoritatively that the people at these points are talking of a thing somewhat chimerical, as the managers of the road do not propose to extend their road to either of these points or down the Peninsula until certain contingencies now remote shall demand it. One of these is the re-establishment of the Rio coffee trade, which prior to the war was very extensive in this city. In exchange for the coffee the vessels would return with cargoes of Virginia flour, which is considered superior to all others for shipment to the tropics. Until this coffee and flour trade shall be re-established, the Chesapeake & Ohio Company will not establish a road on the Peninsula. It was also thought that the immense coal trade which will be developed on the opening of the road to the Ohio River would necessitate the establishment of the depot at Newport News and Yorktown. This matter has been fully discussed by the Board of Directors, and they have concluded that the improvements in the James River, when they shall have been completed, will give a uniform depth of fifteen feet; and with a probable reduction of the price of tonnage of vessels from Richmond to Newport News from twenty cents, as at present, to fifteen cents per ton, the tariff would be so much cheaper by the river than the company could afford to do it by rail as to preclude the idea of a railroad depot to the points last named."

Maine Railroad Projects.

An Eastern exchange says:

"The Maine Legislature is now in session and the probability is that a large proportion of its time will be occupied with the consideration of railroad questions. Among the numerous projects that will be brought up for action the following are the most important: The Maine Central will ask the Legislature to legalize its consolidation and end all litigation. The same corporation desires to extend the Dexter Branch to Brownville, in Piscataquis County, passing through nearly the same towns as the Bangor & Piscataquis road, which latter road also asks for a branch to Brownville; also for an extension of the Farmington Branch to Phillips. The Portland, Saco & Portsmouth Company wishes to build a new line between Kittery and Biddeford nearer to the coast and to the villages than the present track. The Boston & Maine asks for a connection with any road having a terminus in Portland; and is supposed to be intending to ask for an extension of its road to Bath, so as to secure a through route by the seashore to Bangor. Meanwhile the Eastern shore is moving for railroads. A charter is to be asked for to build a road from Calais westward along the shore to Penobscot, at the mouth of the Penobscot River, while the people of Bangor are to ask for a charter to occupy practically the same route—namely, from Bangor through Eastern Maine to the large towns of Washington County. The building of all these lines would nearly double the number of miles of railroad in the State."

Galveston, Houston & Henderson.

The Galveston papers announce the sale, on the 1st inst., of the Galveston, Houston & Henderson Railroad, the sale being made under a decree of the District Court of the United States for the Eastern District of Texas, rendered on the 9th day of August, 1869, and affirmed by the Supreme Court of the United States. The purchaser was Mr. F. O. James, of New York, and the amount paid \$675,000. The sale includes all the property and franchises of the road, except the bridge across West Galveston Bay.

Springfield Street Railroad.

The Springfield (Mass.) Street Railway Company chose the following officers January 10: Directors, George M. Atwater, C. L. Covill, H. W. Phelps, Homer Foot, John Olmsted; Clerk, Gideon Wells; Auditor, E. G. Norton. The business of the company, says the Springfield Republican, is improving, the number of passengers carried during the last nine months being 27,780 more than the number in the corresponding period of 1870. The whole number carried, last year, was 295,488, the average being 19 for each round trip. The exact cost per passenger was 5 cents 5½ mills, being within a few mills of the cost in 1870. During the last nine months of 1871 the cars made 12,042 trips, or 1,817 more than in 1870.

Boston & Lowell.

At the annual meeting on the 9th, the stockholders ratified a proposed increase of \$372,000 of capital, and an issue of \$1,000,000 7 per cent. bonds, to provide means to carry out intended improvements.

Northern Wisconsin.

This railroad was completed from Hudson, Wis., northward to Richmond, 30 miles, about the 1st of the month, the work having been done almost entirely in the months of November and December. If sufficient aid can be obtained, it is intended to extend it to Superior City, with a branch to Bayfield.

Boston & Maine.

Says the Springfield *Republican* of the 12th: "The injunction case against the Boston & Maine Railroad, to prevent the issue of the \$2,000,000 additional stock recently voted for the purpose of extending its road from Berwick to Portland, was argued in the Supreme Court at Boston, on Saturday, by the Attorney General and Charles Francis Adams, Jr., for the Commonwealth against C. T. Choate and E. R. Hoar for the road. On Monday the complaint was dismissed by the court, and the action of the corporation declared legal, as the statute under which the injunction was claimed contains an exception in favor of the extension of the Boston & Maine Railroad to Portland."

Erie—The Heath & Raphael Shares.

The United States Court has compelled the return by the Erie Company of the 60,054 shares of stock deposited by Heath & Raphael as attorneys for English stockholders, for registry. The company claimed 12,735 of these shares; but the court ordered their delivery, and on the 12th inst. they were surrendered by James H. Coleman to the Master-in-Equity, under whose supervision they were registered by the Farmers' Loan and Trust Company and then delivered to the attorney for Heath & Raphael on the 16th inst.

London & Port Stanley.

At a recent meeting of the directors of this company in London, Ont., it was determined to offer the railway for sale, or lease for 20 years, and that the President be requested to advertise for sealed tenders for the same, to be received up to the 1st day of March next; conditions of lease or sale to be hereafter determined by the board.

Dividends.

The Delaware & Hudson Canal Company has declared a dividend of 5 per cent. for the last half of 1871, payable Feb. 1, at the Bank of Commerce, New York.

The Cleveland, Columbus, Cincinnati & Indianapolis Company pays a semi-annual dividend of 3½ per cent. Feb. 1.

Northern Central of Michigan.

According to the Detroit *Free Press* "track-laying on this road has been completed to Albion, and trains are running, not, however, with regularity. Ties and other material are being delivered along the line northward of Albion, and with the opening of spring active operations in constructing the road-bed will be resumed."

Houghton & Ontonagon.

A correspondent of the Detroit *Free Press*, writing from L'Anse, says:

"It is understood that the State Board of Control have extended the time for the completion of the first ten miles, but it is the determination of the company not to avail themselves of the full time of the extension, and hence the pushing of the contractors during this inclement weather. A considerable more than one-half of the entire work on the first thirty-five miles has already been completed, and the work will not be suspended during the winter."

It seems not to be determined whether the road will connect with the Marquette & Ontonagon or with the Peninsula Division of the Chicago & Northwestern; but it is hoped that a connection will be completed with one of them within a year.

Cairo & Vincennes.

This railroad, on which a considerable amount of work has been done, but which for a year or two past has seemed in a comatose condition, if not absolutely dead, shows signs of returning animation. The following is an extract from a recent letter of the President, Gen. Green B. Raum:

"My information from New York is to the effect that Gen. Burnside will reach that city by the 10th inst., bringing with him a contract duly executed by London parties, agreeing to furnish the necessary money for the construction of the road, upon the condition that the traffic contract with the Pennsylvania Company shall be modified in certain particulars, which modifications have been agreed upon, and the papers will be signed upon the arrival of Gen. Burnside."

"Our people can now dissipate all fears and look forward with perfect confidence to the construction of the road during the present year."

The firm of Winslow & Wilson, who have lately completed the St. Louis & Southeastern Railway, and are well known as responsible and skillful contractors, especially in Southern Illinois, are to construct the road as soon as certain preliminary conditions, mostly depending upon the communities along the line, have been complied with.

Ohio & Mississippi.

A survey has been made for a short spur of this railroad from Watkins Station, six miles north of Jeffersonville, southwest to New Albany, about eight miles.

Humbird & Neillsville.

This is a company recently organized in Wisconsin, to construct a branch of the West Wisconsin Railway from Humbird to Neillsville, 16 miles. It is intended to complete it this year.

SCRAP HEAP.**Technical Lectures.**

The Stevens Institute of Technology, of Hoboken, N. J., announces the following course of lectures on technical subjects:

Lecture I.—By Mr. A. L. Holley, C. E., on "Bessemer Machinery." Tuesday, February 6.

Lecture II.—By Mr. A. L. Holley, C. E., on "Modern Rolling Mill Machinery." Thursday, February 8.

Lecture III.—By Prof. J. E. Hilgard, on "Methods of Precision in Weighing and Measuring." Friday, February 10.

Lecture IV.—By Mr. Coleman Sellers, on "Transmission of Motion." Monday, February 19.

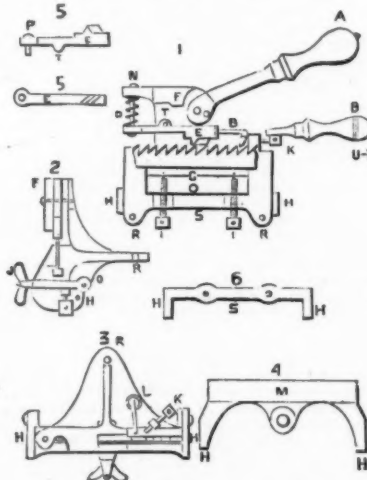
Lecture V.—By Prof. R. H. Thurston, on "The History of the Steam Engine and the Direction of its Future Development." Thursday, February 22.

Lecture VI.—By Prof. R. H. Thurston, on "The History of the Steam Engine and the Direction of its Future Development." Tuesday, February 27.

The names of the lecturers are a sufficient guarantee of the scientific value of the lectures. It will be very much to the credit of the young engineers and mechanics of New York and vicinity if they attend very generally; and to all who are at all interested in the subjects treated an opportunity is here offered of obtaining the most trustworthy and the latest information from the lips of eminent experts. The subjects will be fully illustrated by general and detail drawings. Tickets for the course are one dollar; for one lecture 25 cents.

Saw Set for Band Saws.

The *English Mechanic* saw set for setting band and machine saws is applicable for any others, if the jaws are made deep enough. 1, elevation with a piece of the framing broken away at *F* to strengthen lever; 2, transverse section through the center; 3, view from the top; 4, the movable jaw; 5, 5, the hardened steel sets; 6, the under side of frame at *S*. The best material for wear would be malleable cast iron, and could be made very light, about ½ in. thick for cheeks, &c.; about ¼ in. for the jaws; but this you can please yourselves about. *A* is the lever and eccentric handle, which by being depressed will cause the set, *E*, to descend and set the teeth at the time. The set works upon a pin at *T*; the other end, *D*, is furnished with a boss that is either furnished with a stud or a screw passing through that former one which keeps the spiral spring in its place, that returns the set in its place ready for the next two teeth, which are brought up with the feed handle *B*, which has a screw stop at *K*, that it may be adjusted to any pitch or length of teeth; that lever is hinged upon the top of revolving stud *L*, and as it cannot go back farther than the stop *K*, or forward more than the stop or face of set *E*, it cannot, even if not adjusted very nicely, or the saw be very much out or irregular in the teeth, take more than



two at a stroke, the feed being worked by the left hand, and the set by the right, it can be worked very rapidly, regularly, and I think without breaking teeth, and I think, likewise, with a great saving of time, where they are in continued service (the saw, I mean). *G* is a platform elevated or depressed by the two screws at 1, 1, to regulate the affair to the depth of the saw as they vary from about 1½ in. to ½ in. if put up alongside of the ordinary clips for sharpening; they can be sharpened and set at one heat. The set and lever must be of steel (good cast); the face of the eccentric at *C* must be hardened as hard as possible, leaving the other pretty tough if hardened all over, and the temper brought back to a blue, with the exception of just where the work is. For different pitched saws you will want different sets, as you would different slits in the ordinary set. But these can be replaced at a moment's notice by drawing the pin and shipping another. The set has a V tooth cut upon the face of it diagonally, when making them. By applying them to a saw, you may set the finest saw used as well as the coarsest. The bracket piece or web on the under side at *C* is to carry the vice pin which is made with a joint that it may clip the web, and a pin or bolt passed through the lot. The holes *R R R* are for screws or bolts to hold it upon the face and top of bench. There are two wheels always furnished for running the saws round upon when sharpening them, one being upon a stud pin and slide, with a chain and weight to keep all taut.—*Correspondence English Mechanic.*

Continental Third-Class Cars.

A European paper gives the following concerning a car said to be in actual use on some railroad on the Continent. It is made to seat 84 passengers; 32 on an upper floor, on 8 seats; 50 on the lower floor, on 10 seats, and one seat for two in the upper tier, with places for the conductor and the brake. This car weighs 7,600 kilograms, or 16,756 pounds, which is at the rate of 204 pounds per passenger.

Hints How to Use a Grindstone.

Mr. J. E. Mitchell, of Philadelphia, gives the following instructions:

"1. Don't waste the stone by running it in water, but if so, don't allow it to stand in water when not in use, as this will cause a soft place."

"2. Wet the stone by dropping water on it from a pot suspended above the stone, and stop off the water when not in use."

"3. Don't allow the stone to get out of order, but keep it perfectly round by the use of a piece of gas-pipe, or a hacker."

"4. Clean off all greasy tools before sharpening, as grease or oil destroys the grit."

"5. Observe: When you get a stone that suits your purpose, send a sample of the grit to the dealer to select by; a half-ounce sample is enough, and can be sent in a letter by mail."

Wind as a Motor.

The Bloomington (Ill.) *Leader* is responsible for the following account of an incident during a late gale: "An empty freight car standing on the track at Arrowsmith, on the Lafayette & Bloomington Railroad, was blown to Saybrook, a distance of six miles. While in the timber, just this side of Saybrook, a man jumped aboard and put on the brakes. While on the prairie it is said to have run at a fearful rate, but the timber cut off the force of the wind to a certain extent, and when stopped it was not moving rapidly."

A New Car Company.

The Springfield & Illinois Southeastern Car Company, with a capital stock of \$200,000, filed articles of incorporation in Springfield, Ill., January 10.

TRAFFIC AND EARNINGS.

—The receipts of the Grand Trunk of Canada were:

	1871.	1870.	Increase.	Per cent.
Week ending December 16...	\$29,001	\$20,400	\$8,601	28 ½
" " " " " "	33,900	31,700	2,200	6 ¾

—The receipts of the Great Western Railway of Canada were:

	1871.	1870.	Increase.	Per cent.
Week ending December 15...	\$30,852	\$18,668	\$12,184	11 ¾
" " " " " "	18,847	18,151	696	3 ¾

The Atlantic & Great Western Railroad.

Our English exchanges give the following. The first document is a circular from Mr. James McHenry:

"The Atlantic & Great Western Railroad is now under control of its owners. The formalities required for placing it directly in charge of the board of directors have been completed. The bonds of the reorganized company will be dated 1st January, 1872. The first coupons on the first mortgage bonds will run from that date, and be due on the 1st July. The first coupon on the second mortgage bonds will run from 1st March and be due on the 1st September. The first coupon on the third mortgage will run from the 1st May and be due on the 1st November. All coupons are payable at the offices of Messrs. Bischoffsheim & Goldschmidt, London. The issue of the new bonds in exchange for Bischoffsheim certificates will shortly commence. When the trustees took possession of the road on the 1st September, the publication of the traffic receipts, which had been long suspended, was recommenced, but it was intimated that these returns did not represent the capabilities of the line, as the arrangements with the Erie Railway were necessarily continued, and many of the figures taken from that company's books. Some weeks must elapse before regular and correct returns of traffic can be looked for. The clerical machinery has to be formed and business arrangements with other railroads renewed. In the meantime, we are shaking ourselves free from dependence on the Erie. At Salamanca, where the lines connect, a complete division of traffic will be made, so that our earnings shall not fall into the Erie treasury, whence they have not hitherto been readily extracted, and we have secured an independent entrance into Cincinnati, thus confining the Erie power to their own line, east of Salamanca. The importance of these movements will be shown in a few weeks in increased revenue and decreased expenditure. In order to restore and develop connections with the coal and petroleum districts, to give increased facilities for the local traffic and to secure the advantages to which the position and cost of this railway entitle it, an association of parties interested in the Atlantic & Great Western has purchased a controlling interest in the Niles & New Lisbon and the Liberty & Vienna roads (connecting with the Cleveland & Mahoning), and will construct the Buffalo and other extensions, giving the main line important and independent access to New York and the East, and to the West and Southwest. With the permanent way placed in high condition, and an abundant equipment and ample facilities for economically conducting the service of the railroad, proprietors will find that, though for a time their confidence has been disappointed and outraged, it will at length be justified. The directors, officers and agents of the reorganized company appear determined to lift the railroad into prosperity, and there cannot be a doubt of their success. The Erie Company has restored the road much impoverished every way; the track run down, the supplies exhausted, the freight cars nearly 1,000 short in actual count from the number standing on the books, and the good-will of customers and friendly relations with connecting lines broken up. I annex copy of a letter from the General Manager with requisitions for expenditure on permanent way and rolling-stock. The required rolling-stock has been liberally and promptly provided by an independent company, without calling on the Atlantic & Great Western proprietors for fresh capital. During the term of the contract with the United States Rolling Stock Company, the rebate from profits of that company's business will furnish the Atlantic & Great Western Railroad, free of cost, with an equipment, including that on hand, second to none in America. For rails and permanent improvements, the means must be found at once, for which proposals now under consideration will be submitted to the proprietors. Economies required to earn sufficient net revenue cannot otherwise be introduced; but, with the suggested improvements immediately undertaken and accomplished, the ability to pay interest on all classes of bonds is placed beyond question. Doubling the revenues of the company, as promised in the General Manager's letter of requisition, means an increase to 200,000 dollars weekly, or sufficient to pay interest on the coupons of the first, second and third mortgages, dividends on the preference shares and a fair promise for the common stock. The

accounts of the late receiver, Judge Hitchcock, and of the Erie Railway are in course of adjustment; but there are good reasons why these settlements should not at present be unduly pressed; whatever sums may be recovered from these sources, or from the reorganization stock, will be dealt with hereafter. I have pleasure in handing the list of the new directors, and statement of the capital of the new company, with due dates and amounts of interest on all classes of bonds, and estimates of traffic required to meet coupons, and to pay 5 per cent. on the shares, preference and common. JAMES MCHENRY.

"5 Westminster Chambers, London, S. W., Dec. 12, 1871."

REQUISITION FROM THE GENERAL MANAGER.

NEW YORK, October 6, 1871.

DEAR SIR: I have carefully examined the report of Mr. Lyford in reference to the requirements of the Atlantic & Great Western Railway. I do most earnestly recommend that the improvements relating to the track and rolling-stock be made at the earliest possible moment, particularly the second track on the Mahoning Division. Without going into details of the different items, I give herewith, under proper heads, my views of what should be done during the next ten months; and, if done in that time, I do not hesitate to say that the traffic of the road and its earnings can be nearly, if not quite, doubled in the year following. This may seem a large increase, but I have full faith that it can be done.

PERMANENT WAY.

10,000 tons steel rails, at \$100.....	\$1,000,000
5,000 tons rails to be re-rolled, at \$35.....	185,000
6,500 tons rails for third rail from Leavittsburg to Corry, connecting the coal and petroleum regions with the narrow-gauge portion of the Atlantic & Great Western.....	650,000
Bolts, spikes and spikes.....	100,000
250,000 ties or sleepers.....	125,000
Additional side track, cranes, etc.....	100,000
New stations and repairs of old ones.....	150,000
Machine shops at Cleveland and elsewhere.....	300,000
New fencing.....	50,000
Masonry.....	100,000
Straightening line and reducing grade at Pine Valley.....	75,000
	\$2,835,000

ROLLING STOCK.

200 iron tank petroleum cars.....	\$220,000
1,000 coal cars.....	600,000
1,000 box cars.....	800,000
600 stock cars.....	420,000
30 passenger coaches.....	200,000
40 locomotives.....	480,000
	\$2,720,000

(Signed) H. F. SWEETSER.
CAPITAL OF THE ATLANTIC & GREAT WESTERN RAILROAD COMPANY, AS REORGANIZED.

Bonds.		Sterling of \$s. to dollar.
First general mortgage bonds.....	\$11,014,006	\$2,202,801
In addition there must be provided for the redemption of the reorganization stock, \$5,000,000.....		
Second general mortgage bonds.....	8,445,500	1,680,118
Third general mortgage bonds.....	28,215,101	5,643,020
	\$47,674,607	\$9,525,939
Shares.		
Preferred stock.....	\$9,875,906	\$1,975,181
Common stock.....	19,960,000	3,990,000
	\$29,835,906	\$5,965,181
Summary.		
General mortgage bonds.....	\$47,674,607	\$9,525,939
Shares.....	29,835,906	5,965,181
	\$77,500,603	\$15,600,120

AMOUNTS REQUIRED FOR INTEREST AND DIVIDENDS.

Bonds—Payments Absolute.		
First mortgage bonds, requiring a net annual revenue to pay 7 per cent. of.....	\$770,981	\$154,196
Reorganization stock, ditto.....	280,000	56,000
Second mortgage bonds, ditto.....	501,191	100,238
Cleveland & Mahoning, rental.....	2,400	54,800
	\$1,554,572	\$315,234
Payments contingent on earnings during the year—		
Third mortgage bonds, requiring a net annual revenue to pay 7 per cent. of.....	1,975,057	395,011
Shares.		
Preference stock, requiring a net annual revenue to pay 5 per cent. of.....	493,795	98,759
Common stock, ditto.....	997,500	199,500
	\$1,491,295	\$298,259
	\$3,045,867	\$613,493

DATES PROPOSED FOR RESUMPTION OF PAYMENTS, AND STATEMENT OF NET REVENUE REQUIRED FOR COUPON INTEREST IN 1872.

Reorganization stock, half-year's interest at 7 per cent. per annum.....	\$28,000 payable 1st March.
Ohio bonds, ditto.....	17,565 " 1st April.
First general mortgage bonds, ditto.....	77,098 " 1st July.
Reorganization stock, ditto.....	28,000 " 1st Sept.
Second general mortgage bonds, ditto.....	501,191 " 1st S. pt.
Ohio bonds, ditto.....	17,565 " 1st Oct.
Third general mortgage bonds, ditto.....	191,505 " 1st Nov.
Total.....	\$242,852

DIRECTORS OF THE ATLANTIC & GREAT WESTERN RAILWAY COMPANY, ELECTED 11TH DECEMBER, 1871.

General George B. McClellan, New York.
Lloyd Aspinwall, Esq. (Messrs. Howland & Aspinwall), New York.

S. L. M. Barlow, Esq. (Messrs. Barlow, Larocque & Macfarland), New York.

William B. Duncan, Esq. (Messrs. Duncan, Sherman & Co.), New York.

Abraham S. Hewitt, Esq. (Messrs. Peter Cooper & Co.), New York.

Hon. Reuben Hitchcock (late Receiver), Cleveland, O.

James B. Hodgskin, Esq., New York.

Henry F. Sweetser, Esq. (General Manager), Meadville, Pa.

John Tod, Esq., Cleveland, Ohio.

Laurence Wells, Esq. (Messrs. Schuchardt & Gebhart), New York.

Hon. George B. Wright (late Commissioner of Railways of the State of Ohio), Cleveland, Ohio.

James M'Henry, Esq., London.

Henry P. Sharp, Esq., London.

President—General George B. McClellan.

Vice-President—Hon. George B. Wright.

Treasurer—James B. Hodgskin, Esq., New York.

Secretary—Charles Day, Esq., New York.

Agents in London—Messrs. Bischoffsheim & Goldschmidt, Founders' court, Lothbury, London.

First Annual Report of the Illinois Railroad and Warehouse Commissioners.

To His Excellency John M. Palmer, Governor of Illinois:

In compliance with the act establishing a Board of Railroad and Warehouse Commissioners, approved April 13, 1871, in force July 1, 1871, which makes it the duty of the Commissioners to report to the Governor their doings for the preceding year, on or before the 1st day of December, in each year, the undersigned Commissioners beg leave to present to you the following report:

ORGANIZATION AND ACTION OF THE BOARD.

The law having gone into operation on the 1st of July last, the Commissioners received their commissions, and were qualified by the 5th of July last, when they met at Springfield, and organized by the election of Gustavus Koerner, Chairman, and J. H. Raymond, Secretary, and by adopting rules and regulations for the transaction of business; appointed regular monthly meetings the first Tuesday of each month, and also provided an office, stationery and furniture. A circular was addressed to all the railroad corporations doing business in this State, informing them of the organization of the Board, directing their attention to the constitution and the laws, as far as they have a bearing upon such corporations, and requesting them to report fully by the 1st of September, 1871, as provided by the sixth section of the act creating this Board.

For the purpose of obtaining a proper classification of the said railroads, as contemplated by the act establishing a reasonable maximum of charges for the transportation of passengers, in force July 1, 1871, the companies were requested to make a special return to the Board, on or before the 1st of August, 1871, showing the gross amount of their last annual earnings, viz.: from the 1st day of July, 1870, to the 1st day of July, 1871, and also the total length of road operated by them on which said earnings were made.

The Commissioners beg leave to refer to said circular, which is made part of this report, and which was issued on the 13th of last July. By the first of August, 1871, this special report as to the number of miles within the State, and gross earnings per mile, had been received but from one railroad company.

The principal railroad companies in this State, however, by their representatives, appeared before the Board, at its session in August, and gave their reasons why they had not completed their preliminary reports within the time mentioned in the circular. The correspondence in regard to that matter, and also as to certain suggestions made by the representatives of the railroads, having reference to the contesting of some parts of the various laws lately passed relating to the operation and business of railroads, will be found in the appendix.

At the September session of the Board, many reports had been received, but several of them were imperfect, and were returned, for amendments; and it was not until its session in October that nearly all the railroad corporations had made their returns, and that a classification could be ascertained such as the law requires. A list of the reports, with date of reception, filing, etc., will be found in this report.

These reports must prove interesting in the highest degree to our people, as the railroad interest is by far the greatest now in the State, involving nearly every other one. If this Board should succeed in nothing else than in furnishing the public with accurate and reliable information as to the operation of the large moneyed power embodied in the railroad interest, so as to indicate means of protection against its encroachments, it will have performed a very important and useful function of a considerate government.

It will be perceived, upon examination of these various reports, that, with few exceptions, they are still more or less imperfect. The form of the returns, as given by the act creating this Board, is plain enough; but when it is considered that almost every corporation has a form and method peculiar to itself in making entries and keeping accounts, aggregating items which are separated in one instance, while in another separating other items which are aggregated in the legislative form; that many of the present corporations are the result of numerous transmutations by legislative, judicial and voluntary action (consolidation), so as to make it almost impossible for them to give information as to who were the original subscribers of stock, by whom its capital was paid in, how much was paid in cash, etc.; that many of the roads were completed only a short time before the law went into force, and that several of them are only partly constructed, while others are controlled by lessees merely—the defects in the returns can be readily accounted for. One of the principal difficulties arises from the fact that many of the roads in this State are only links of what may be called national lines, which lines, while forming but one corporation, are chartered in different States, and are managed and their accounts kept without reference to State boundaries. Under our present laws, it becomes a very important question, with a view to classification, to know the amount of gross earnings of the roads within the State; and, inasmuch as many of the roads do not keep separate accounts in each State, only an approximate estimate of such earnings could be obtained in some instances. It appears, from the reports of similar Boards in other States, that the difficulty in getting complete reports was experienced, even in a greater degree and for a greater length of time than by this Board; and it may be said that this Board has succeeded, by continued suggestions and instructions, in obtaining more perfect returns than could have been expected within so brief a period after the adoption of the system.

PASSENGER FARES.

The classification arrived at from the returns of the gross earnings and the length of railroads in this State was notified to each company, and publicity through the newspapers was given of such classification. From present information, the Board believes the fare has not been regulated according to the classification obtained by those roads which were thrown into the first two classes, necessitating a reduction of passenger fare if the law is obeyed. The act in question gives to the party aggrieved a penal action for the recovery of \$500. Some actions have been instituted by private persons against some of the corporations for overcharging, but the Board is not advised of the result.

Under the law, as it now stands, the action to enforce penalties for its violation is given to the party aggrieved exclusively, and this Board does not seem to possess any authority to institute actions to recover penalties for the violation of that law, nor has it any control over actions instituted by private individuals. In this respect the law would seem to be defective, since it throws upon individuals the burden of enforcing the general policy of the State with reference to railroad charges.

The act further provides, in order to enforce the law, that if a final judgment shall be recovered a fifth time against any defaulting corporation under the provision of the act, it shall work a forfeiture of its franchises, and it is made the duty of the respective Circuit Attorneys to proceed for such forfeiture by information in the nature of a *quo warranto*. It is needless to say that no occasion has thus far arisen to give room for any such proceedings under the "passenger fare act." It is very true that the act appointing this Commission contains a general provision that they shall prosecute, or cause to be prosecuted, all corporations or persons guilty of violating any laws of this State now in force, or which shall be hereafter in force, concerning railroads and warehouses; but as the mode and manner of prosecution, except in some specific cases—as for instance, when those corporations refuse to make returns—is not indicated, the Board have not found it practicable to commence any official proceedings for a violation of the

"passenger fare act." They have corresponded with the Attorney-General of the State, at an early period, in regard to their power to prosecute, and on other points, and they beg leave to refer to this correspondence, which is appended.

FREIGHT DISCRIMINATIONS.

It appears, from the very reports of most of the railroad corporations, that the act to prevent unjust discrimination and extortion in the rates for the transportation of freight is systematically violated; inasmuch as higher rates are charged from local than from competing or terminal points. Many complaints have been received on that head. In every instance we have turned the person complaining to the provision of that law which gives an action for a penalty of \$1,000 to the party aggrieved; but they have steadily declined to prosecute, giving, as a reason, that they did not want to give offense to the companies, who had it in their power to deny them accommodations when most wanted, and could injure them in their business much more than the recovery of many penalties would benefit them. When required to give us an authentic statement of the cause of complaint, verified by affidavit, so that we might proceed under the fifth section of the act which enacts that proceedings for a forfeiture of the charter may be instituted upon any violation of its provisions, they failed to do so with one exception, hereafter to be mentioned.

Information having reached the Commissioners that the provisions of the section quoted had been violated by the Chicago & Alton Railroad Company, and satisfactory evidence of such violation having been placed in their hands, they have instituted proceedings under the provisions of said section 5. They have instructed J. H. Rowell, State's Attorney for McLean County, in which such violations were committed, to apply to the Circuit Court of that county for leave to file an information in the nature of a *quo warranto*, to declare the charter of that company forfeited. These proceedings have been but recently instituted, but the prosecution will be pressed with vigor at the earliest day practicable.

POLICE REGULATIONS.

The Board, or its members, since their appointment, have pretty extensively traveled over the State, and have noted manifest violations of some of the few police laws heretofore existing in regard to the railroads in this State, either found in the general statutes, or in some of the charters themselves. They have in every instance notified the respective corporations of cases of neglect, and they have received promises at least of a stricter compliance with such police regulations. Finding, particularly, that many highway crossings were unsafe, they have especially directed the attention of the railroad companies to this subject, and in order to procure a general and strict enforcement of the law of 1869, for the protection of the lives and property of persons at railroad crossings, they have issued a circular to all the County Surveyors, which, judging by the many replies that have been received, seems to have enlisted their attention. The law itself is too complicated and partly impracticable, and would seem to need amendment. It is to be remarked that this State has more miles of railroad actually constructed than any other State in the Union, and that a personal and critical inspection on the part of this Board of all the roads, with a view to their condition in detail, as regards their construction, connected with the safety of the lives and property of the community, is a physical impossibility, even if every member of the Board were supposed to have the requisite technical knowledge; and it may be necessary, if the law contemplates such critical examination, to authorize the Board to employ competent experts to make special inspection of the condition of any railroad where, in the judgment of the Board, the safety of the public requires it.

Information has been received, however, from various parts of the State, that the very existence of a supervising board, such as this is, has had beneficial effects, and that more care and vigilance are being employed in the management of this all important interest.

EXPENSES OF THE COMMISSION.

The Commissioners call attention to the communication from their Secretary, James H. Raymond, as to the expenditures, etc., etc., of the office, and to the recommendation therein contained. A slight increase of the appropriations for incidental expenses, as recommended by him, would enable the Board to provide better for the safety of the records and papers in the office, and place it upon something of the same footing as the other offices of the State Government. The zeal and unremitting attention of Mr. Raymond, at the office of this Board in Springfield, have produced results valuable to the State and creditable to himself.

The Board was gratified to see, in the last message of your Excellency to the present session of the Legislature, an allusion to the subject of compensation for professional services in enforcing the laws regulating railroads and warehouses in this State, and cannot but add their testimony to the expediency of such a provision.

The experience of the Board has already shown the importance of authority being vested in some suitable department of the government to employ professional aid which possesses the special and peculiar knowledge requisite for the proper prosecution of cases growing out of those laws. They would, therefore, suggest that authority should be conferred upon this Board to employ, with the approval of the Governor, such counsel as they may think necessary to aid the Circuit Attorneys in such prosecutions.

CONDITION OF THE OLDER RAILROADS IN OPERATION.

The general character and condition of the roads in this State which have been for some time in operation will compare favorably with that of roads in any of the Western States. The past season has been unusually suited to the keeping of railroads in repair, and the roads in this State may be said to be, on the whole, in good order, according to the standard in that respect in the United States. But few of the roads are as yet thoroughly ballasted; this is occasioned by the scarcity of suitable material for the purpose along the lines of road. The work of ballasting is, for that reason, more expensive, and necessarily requires longer time than it would if the material was found at frequent intervals, so as to require but a short haul for its distribution.

The capacity of these roads for the transaction of business is being increased, so as to meet the growing wants of the people, and their mechanical structures, such as bridges, station buildings and the like, are being improved. The early structures, which were temporary in character, are rapidly giving place to permanent and substantial ones. Generally their character and capacity are being greatly improved.

The equipment of these roads, as to engines, passenger and freight cars, may be regarded as excellent; particularly the accommodation for passengers furnished in this State is quite as good if not superior to that furnished by any of the leading roads in the country.

The recent adoption of dining cars for the accommodation of passengers, instead of stopping trains at eating stations, which has come into use on several of the important roads, involves the necessity of passengers passing from car to car through the trains while they are running at full speed. The practice of passing through trains in that manner has always been regarded, and proven by serious loss of life, to be very dangerous; especially is this so where the old style coupling, draw-head and platform are used.

The danger to life in this regard is considered by this Board to be quite enough to require legislative action which shall oblige, at an early day, the use of platforms and couplings of some of the various forms now well known, by means of which these dangers may be materially diminished.

As the platforms of passenger cars are structures usually made independent of and attached to the body of the cars, the

necessary changes can be readily accomplished at moderate expense, and the Board therefore recommend that after one year the use of any platform and coupling on passenger trains, except such as when coupled together are and remain in near contact, should be prohibited by suitable penalties.

RAILROADS RECENTLY BUILT AND IN PROCESS OF CONSTRUCTION.

The construction of railroads in this State during the past year, especially in the central and southern portion of it, has been pushed with unusual energy and activity.

This has been stimulated and chiefly occasioned by the anxiety of the people living in the various localities interested to secure the construction of the roads before the local subscriptions voted in their aid by counties, cities and towns should be lost by lapse of time or otherwise, and also by an equal anxiety on the part of the older and more powerful corporations to protect themselves against probable competitions or encroachments upon what they call their "legitimate territory," by reason of the construction of these new lines. Thus, in most instances, upon the surrender of the control of the new roads (this being a condition precedent), the competition existing between the old corporations, having the necessary credit, and their common desire to obtain control of new territory and of securing an increased basis for the issuing of stock, either in their own companies or in the new ones of which they obtain control, have induced those older companies to furnish the iron and equipment necessary for a partial completion of these roads; only sufficient, however, to enable trains to be moved over them, and leaving the roads in a condition still requiring large expenditures for their suitable and satisfactory completion.

As a rule, the money employed in the construction of these new roads was obtained by the sale of local aid bonds, amounting to from \$5,000 to \$8,000 per mile, and also the sale of from \$15,000 to \$25,000 per mile of the first mortgage bonds of the road, secured upon the franchise, right of way and depot grounds (which were mainly donated), and also upon the grading and bridging which the new companies had been able to accomplish by a careful expenditure of the proceeds of the local aid bonds.

In this manner, by a sale of both classes of bonds, even at as low a rate as 80 cents, the average aggregate product in money, after paying all negotiating expenses, can be reasonably estimated at \$21,200 per mile, quite enough, it is believed, to construct and equip the road as well as it has been done. The Commissioners are, therefore, forced to accept the conclusion that, as a rule, all certificates of railroad stock issued upon the new roads in this State, excepting that issued in payment for county, city and town bonds, is fictitious. The usual method adopted for the completion of the new roads is, that the parties owning or controlling the old roads, who are to take control of and complete the new ones, enter into a contract for such completion.

The corporation owning the new road, on their part, agree to pay such contractors the unexpended balance of the local aid bonds, if any, the first mortgage bonds to be issued by the company upon the new road, and also a certain amount of the capital stock of the company, in nearly all cases greatly more than all the other capital stock which has been subscribed for or issued.

It will be seen that, by this method, the new road is actually constructed and paid for by means which itself produces, and that the capital stock issued under the contract is really parted with without consideration, and passes to the holders forever the control of the road. This process is carried out with various modifications of form, all, however, in the end, reaching the same result.

It is proper to state here that doubtless most of this "full paid stock" so issued, and paid by a resolution to that effect, is the result of the astuteness of the managers of the great through lines, who, having thus possessed themselves personally of these large amounts of stock, immediately commence what has come to be an intelligent and systematic grinding process upon the people, under the plea of chartered rights, to extort by unjust charges earnings equal not only to paying the interest on the actual cost and bonded debt, current expenses and "improvements" (by which is meant the construction proper, admitted to have been done), but also on the excessive stock thus issued without any real consideration.

All the ingenuity and knowledge of such matters, which these men so largely possess, are at once mobilized for the work not only of enforcing earnings for the roads equal to paying all legitimate demands, but also that they may receive dividends upon and create a market value for their illegitimate stock.

STOCK WATERING.

As time rolls by, and the capacity of the roads is gradually increased by "improvements" made out of the earnings in addition to paying interest on bonded debt and stock dividends, and the capability of the communities living adjacent to the lines to produce and the population increases, another stock issue takes place, limited only by the capacity of the road thus improved to bear the burden. And in the same manner other stock issues will, from time to time, be made to satisfy the ever-increasing cupidity of these men; and so on and on, until the utmost capabilities of the country to respond shall be reached.

These additional issues of stock, or stock dividends, as they are called, are made upon the pretext usually that they represent earnings of the roads which have been capitalized in improving its condition and enlarging its capacity for business. In some instances this may be partially true, but it is also true that the necessity for such enlargements and improvements mainly arises from the imperfect condition of the roads at the time they were called completed; therefore, until such imperfections shall have been made good by the expenditure of a sum out of the earnings of the roads equal to the amount of the stock fictitiously issued in the first instance, and all dividends paid thereon, together with interest, not even a plausible ground can exist for making stock dividends to represent what is claimed to be capitalized earnings. The truth is, that in the cases alluded to, the earnings have been capitalized years before they were made.

Thus it will be seen that the *fictitious capital*, and not the real money employed in the construction of the roads, is mainly benefited by a practice of the theory of capitalizing earnings.

The Commissioners are not prepared to recommend a remedy for these alarming evils, but have been impelled to the foregoing earnest suggestions as to the actual workings of railroad construction and transportation, in their bearings upon the business and prosperity of the people of this State, by the vital importance of early and effective action by the Legislature.

CONSTRUCTION OF RAILROADS IN THE FUTURE.

It is unnecessary, at this period of the world's history, for the Commissioners to enlarge upon the value and importance of railroads as promoting the public welfare.

To the people of this State, who are largely destitute of natural means of internal transit, and where the topography of the country seems to invite their construction, railroads are indispensable; therefore every effort possible of the public authorities should be made to encourage their judicious and economical construction, and secure their just and economical management.

To this end it seems to the Commissioners that no means can be so well adapted as the enactment of a well-considered general law, authorizing the construction of roads wherever, in the judgment of capital, they will be found to be most remunerative. It is believed that the selection of the lines over which railroads are hereafter to be constructed in this State

may be safely left to the determination of the persons who furnish the money to build them.

The fact, also, that the business of any given section of the State is subject to be competed for by a new road, possibly built and operated upon a more economical plan, will doubtless have a strong tendency to induce existing roads to make their charges for the transaction of that business so moderate as not, by exorbitant profits—the fruit of unjust rates—to tempt the construction of competing lines.

Such a law, with suitable safeguards, such as experience has shown to be wise and necessary, should protect, in a considerable degree, the public and individuals against corporate extortions.

It would also probably be wise to retain to the State the power of supervision and control over all corporations to be created under it, which it is claimed has been parted with by many of the special charters heretofore granted, the validity of which claims promises to furnish a fruitful source of litigation.

After providing the safeguards to the public, just mentioned, the provisions of the general law authorizing the construction of railroads should be exceedingly liberal, and such as in the highest degree to invite and protect the investment of capital in such enterprises, thus to secure as far as possible a healthful and real competition.

Such a law, too, would probably furnish the means of satisfactorily testing some of the recent opinions of civil engineers of the value of railroads constructed upon plans much less expensive, and operated much more economically than existing roads.

If it be true that the "narrow-gauge" railroads, or the adoption of light equipment for the present roads, have the advantage of economy which they are claimed to possess, it is very desirable to the interests of the people of this State that their construction should be fostered and encouraged.

It is to be remembered that the railroad system of the world is of very recent origin, that it has come into existence within the memory of many men now living; and it is therefore not unreasonable to expect that enlarged experience may point out many grave and even fundamental errors in their construction and working.

Such a law as is suggested might facilitate improvements which would prove of the highest value to the public, and which existing companies would be slow to adopt by reason of the great first cost apparently involved in the requisite changes.

THE PRESENT LAWS, AND SUGGESTIONS AND AMENDMENTS.

In order to carry out the constitutional provisions regarding railroads and warehouses, five distinct laws were passed at the first part of the first session of the Legislature, under the new Constitution. It is very evident that those laws were conceived and framed by different minds; and whatever merit each one may have by itself, yet, being passed independent of one another, they do not, on closer examination, furnish such a harmonious whole as might be desired. The Commissioners as well as the Attorney General, whose advice they have sought in some instances, have found it somewhat difficult, if not altogether impossible, to reconcile many of the provisions of the said laws. While the late warehouse act repeals, in terms, all other acts on the subject inconsistent with it, including, as we deem it, the power of inspection and registry granted in the law establishing a Board of Trade in the city of Chicago, such repealing clause is not to be found in the law establishing this Board, nor in the one preventing unjust discrimination in the rate of charges for transporting freight, nor the one establishing a maximum of passenger fare. Whether and how far the law entitled an act concerning railroad rates for the conveyance of passengers and freight, approved March 10, 1869, is repealed, and whether, if not repealed, the Commissioners are to act under it, if the necessity of such action should arise, are also questions involved in doubt. But even where there is no real or apparent conflict in the various provisions of those different acts, there are some obscurities of language, or what at least seems to them so. A careful revision of the acts, or a systematic and well-digested compilation of them into one general law, is hereby earnestly recommended.

FORFEITURE OF CHARTERS.

Another source of great embarrassment arises from the various modes provided in those different laws for punishing a violation of them. In most cases, remedies are given to the persons actually aggrieved by such violations. For some violations of the same character quite different penalties are imposed. To give an instance: It is provided, in the act to prevent unjust discrimination and extortion in the rates of freight, that any willful violation of any of its provisions, on the part of any railroad corporation, shall work a forfeiture of the charter, while in the act relating to passenger fare, it requires five different convictions for a violation of the act before a forfeiture is incurred. In the act establishing this Board, the Commissioners are authorized to institute and prosecute suits for all violations of the said act, or of any law of this State concerning railroad companies or warehouses, and it is provided that the Attorney-General and the Circuit Attorneys are to prosecute under their directions; yet the kind of actions, and whether they should be criminal or civil, and in many cases the penalties for violating the law are not indicated at all—so that, practically, the action of the Commissioners is beset with difficulties. It is the opinion of the Commissioners that while the remedy to private citizens to sue in a penal action may be retained, there ought to be a general provision by which any such violation of law, or of charters, should be made an indictable offense, or subject the offender to a penalty to be sued for by the State, so that the public may at once have a simple and speedy mode of redress. Proceedings for forfeiture might be dispensed with, except as a last resort, as, in case such forfeiture should be judicially declared, while the State has no power under the Constitution to confer the franchise on anybody else by special incorporation, or to resume the management of the franchise itself, the public interests would be so injuriously affected in the absence of any provision for continuously operating the road, that it might be doubtful whether the severer punishment would not be inflicted upon the people.

All the existing police regulations now scattered through many statutes, and such as may be suggested concerning railroads, should be compiled into one law. The Commissioners have prepared such a bill, and will respectfully submit it to the Legislature. The Chairman has also prepared bills to remedy what are considered as defects in the laws heretofore more particularly referred to, also to be submitted. They are aware that they have assumed a task, the delicacy and difficulty of which only those who have ever undertaken the framing of laws on important and complicated subjects can adequately appreciate. But carefully considered and revised as those bills will be by the Legislature, and passed into one law or more, if need be, it is hoped to secure a more certain guide to the officers who are charged with their execution, and a more intelligible rule of action to those who are specially to obey them.

WAREHOUSES—ORGANIZATION OF THE INSPECTION AND REGISTRATION OFFICES.

On the 9th of July last, the Board of Commissioners had a special meeting at the city of Chicago, for the purpose of organizing the Inspection and Registration Departments, provided for in the act approved April 25, 1871, and in force July 1, 1871, regulating public warehouses and the inspection of grain, and to give effect to article 13 of the Constitution of this State.

Mr. W. F. Tompkins, the Chief Inspector of Grain for the city of Chicago—said city being the only one containing warehouses of class "A"—appointed by you according to the law

just referred to, and whose duty it is to nominate a numerous corps of assistant inspectors, clerks, etc., not having had time to select the same, and it being besides necessary to provide an office, furniture, etc., and to have the proper books and blanks prepared and printed, the Board could not finally organize the inspection and registration departments before their regular meeting in August, 1871, at Springfield. Mr. Stephen Clary was appointed by the Board Chief Registrar. The nominations of Mr. Tompkins were examined and approved by the Board. The number of officers, their salaries and duties, in both departments, were fixed by the Board as the law requires. They also adopted rules and regulations for the inspection of grain, fixed the rates of charges for inspection, and the manner of collecting the same—a duty which the law likewise has devolved upon the Commissioners.

The inspection of grain and registration of warehouse receipts having been previously in charge of the Board of Trade of the city of Chicago, and having been carried on under the control of said Board, the Commissioners have, in the main, adopted the rules which experience had taught that Board to be practical and advisable.

With some modifications, the same number of officers as existed under the Board of Trade, in both departments, were appointed, and also their salaries fixed upon the old standard, with few exceptions. The season of the grain business being then at its height, and the receipts of grain unusually large, upon the recommendation of the inspector a greater number, particularly of subordinate assistants, were employed than will be necessary throughout the year; but, under the terms of appointment, the number may be decreased monthly.

The Commissioners have simply embodied in their rules the law which fixes the grades of grain. The inspection fees have thus far remained the same as they were under the administration of the Board of Trade. The report of the Inspector of Grain, up to the first day of October, shows an unprecedented receipt of grain in the city of Chicago; and this Board has been compelled to slightly increase the force in the Inspector's office, to meet the pressure of business. The terrible calamity which overcame our commercial metropolis, on the 8th and 9th of October, swept away the building wherein the offices of inspection and registration under this Board were kept, and destroyed the furniture, but fortunately the records and valuable papers of the Inspector, as well as the Registrar, were saved by the judicious and timely efforts of the Registrar and one of the inspection officers. Those records and papers, so preserved, have been of the most important service to the persons engaged in the grain business, as they furnish the evidence of grain receipts, most of which had been destroyed by the fire. For full information the Commissioners refer to the general and special monthly reports of said Inspector and Registrar, and the tables accompanying said reports, showing the amounts and grades of grain received and shipped in each elevator, to November 1, 1871. There is no doubt that these reports, referring as they do to so important a branch of business in our State, will prove highly useful and interesting.

The Board wishes, in this connection, to call special attention to the supplemental report of Mr. Tompkins, the Chief Inspector of Grain in Chicago, and the tables accompanying it, from which it appears that, notwithstanding the general destruction of business consequent upon the fire in that city, the grain trade has proceeded without interruption, and assumed almost colossal proportions. While, from August 7 to November 1, 1870, there were inspected 41,990 car-loads on the track, there were inspected, within the corresponding time in 1871, 60,257 car-loads. While during the like period in 1870 there were inspected a little more than 27,000,000 bushels of grain, the number within the same time in 1871 amounted to over 52,500,000. The cost of inspection during this period, in 1870, amounted to \$15,900; while for the same time in 1871, on nearly double the quantity, it was only \$14,256.

The Inspector also recommends some change in the grading of corn, as also that the grading should be liable to be modified by the Board, as circumstances might require. The Commissioners invite special attention to those suggestions of the Chief Inspector.

It will also appear from these reports that the officers, with the most commendable energy, have, within the shortest possible time since the fire, occupied a temporary office, improving the furniture, and have vigorously gone to work, so that there has been hardly any interruption in business. That this was performing a most important service to the commerce of Chicago and this State can admit of no question. The Commissioners take pleasure in saying that, from all they have been able to see themselves, and from what they have learned from others, the inspection and registration, as now conducted by the State authority, have given very general satisfaction to the commercial community and to the producers, and is considered as having been judiciously and effectually managed.

WAREHOUSE LICENSES.

At an early period official information was received by the Board that none of the warehouses of Class "A," which are required by the act regulating public warehouses to take out licenses, had complied with the law in that respect. As no possible excuse could exist for such an open violation of a plain law, the Board at once instructed the State's Attorney of Cook County, wherein all warehouses falling under Class "A" are situated, to institute proceedings against said delinquent owner or manager of warehouses. The letter to that effect will be found in the appendix. It is understood that such proceedings were commenced, but owing to the suspension of all legal transactions, in consequence of the fire, no further information has been received, and whatever steps may have been taken by the State's Attorney will have to be retaken when the courts shall again resume their functions. It is also understood that the said warehouses do not conform to the maximum of charges for storage as they are fixed in the said law. It being, however, a doubtful question, from the reading of the law, whether said maximum should become operative in the current year or from the first of January, 1872 (see correspondence with the Attorney-General), the Commissioners have refrained, thus far, from ordering legal proceedings against the said warehouses, being of opinion that no issue should be tendered by the State except on grounds which are supported by the plain and unequivocal language of the statute.

The several enactments affecting warehouses, and found in not less than four different laws under different titles, present much embarrassment as to their proper construction. They manifestly require revision, consolidation and systematic digestion. Warehouses in those acts are defined in strict accordance with the constitution, and thus classified; yet it will be seen that nearly all the provisions to be found in the several laws refer only to warehouses of Class "A," while the other two classes are only, as it were, incidentally mentioned. While the various laws provide for taking out a license by warehouses of Class "A" for filing a bond by their owners, for a system of inspection and registration, fix a maximum of charges and place them under the control of the Board, no sort of relation is established between warehouses of Class "B" and "C" and this Board. Some general provisions of the law, as to receipts, handling of grain and the mixing thereof, are made applicable to such warehouses; but as there are no subordinate officers charged with supervision, they practically escape all control.

Applications having been made from important commercial points on the Mississippi River, principally with a view to prevent a diversion of the grain shipments from Chicago to points outside the State, to have inspectors appointed, could not be entertained by the Board, as they have no authority over inspection except as to warehouses of Class "A."

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The Board recommends the passage of a general law which will provide for the regulation and control of all public warehouses, of whatever class, upon a system securing uniformity as to the methods of inspection, and also as to the registration, of grain throughout the State. The Commissioners are fully satisfied that a zealous and careful management of the inspection and registration of grain by State authority will secure at an early day the high degree of public confidence so desirable in connection with the minute, varied and extensive values and interests touched by the action of those departments.

GENERAL REMARKS.

By the tenth section of the law creating this Board, the Commissioners are directed to make such suggestions as to them may seem appropriate, and particularly: First, whether, in their judgment, the railroads can be classified in regard to the rate of fare and freight to be charged upon them, and if so, in what manner. Second, whether a classification of freight can also be made, and if so, in what manner.

From the short time the Commissioners have been in office, and the necessity of first organizing the Board and setting its various departments in something like working order, it has inevitably resulted that they have not had leisure enough to study questions of much magnitude and intricacy to such an extent as to make their views and opinions more than merely suggestions.

Laying aside for the present the question of power in the Legislature to regulate freight and fares, the manner and mode of such regulations in States and countries where such power is unquestioned has exercised the best minds of the proper departments, and the most various views have been presented and adopted.

While in the beginning, in Great Britain and on the Continent of Europe, as well as in our own country, the greatest reliance was placed on the principle of "competition as a regulator and protector of the interests of the community at large, and non-intervention on the part of the Government was the accepted doctrine, experience has shown everywhere that such competition as has been hitherto obtained, and non-intervention, have in a great measure failed to prevent unjust discriminations and absolute extortion. In the first place, competition was met by consolidation, or rather combination; and in the next place, where competition was not so met, the tendency of it was to unreasonably lower the charges from competing or terminal points and to unreasonably increase them for transportation between intermediate points. In brief, through fare and freight were comparatively low, and local fare and freight were comparatively high; but even where the local fare and freight are reasonable in themselves, yet where they are higher than through fare and freight, it inflicts the most ruinous consequences upon the local public.

THROUGH AND LOCAL FREIGHTS.

In the many complaints the Commissioners have heard about unjust management on the part of the railroad companies, in regard to freight more particularly, the grievance was not so much that the charges were intrinsically too high, although even that is often the case, but that they were higher than from competing or terminal points.

If the miller who ships flour from some point in the center of the State must pay from 15 to 22 cents more per barrel for its transportation to New York or Boston than the miller at East St. Louis (and such is actually the case), how can he compete successfully with the latter? He may pay only a *reasonable* freight, and yet be compelled to break up his business and move to some terminal or competing point. It will be seen, therefore, that legal provisions which insist merely upon reasonable charges may not accomplish the beneficial purpose they were intended to reach. If what is reasonable is left to be decided by the courts and Justices of the Peace in the various counties and precincts of the State in each case, no sort of uniformity could be ever attained, it being differently decided, perhaps, in adjoining precincts.

Competition, then, by itself, so far at least as local trade is concerned, which is much the largest portion of the business of all railroads, being in this State rarely if ever less than 90 per cent. of the gross earnings, has wholly failed to accomplish the result desired, and has frequently been extinguished by combination.

CONSOLIDATIONS AND COMBINATIONS.

Our Constitution and also our laws, and the constitutions and laws of some of our sister States, have forbidden consolidation of competing or parallel lines.

But while technical consolidation under the forms of law may therefore be prevented, the most ingenious legislation cannot stop the making of general business contracts, of private and legitimate understandings, by which precisely the same object can be attained as by consolidation—such as leases, operating contracts, and the like, which are in effect equivalent to a regular consolidation. And in regard to freights, the railroad corporations, as such, have in many instances almost entirely divested themselves, as corporations, of the business of freight transportation; especially, as to through freights, they merely act as common carriers to other companies—such as the express and fast-freight lines companies, the latter of which and not the railroad corporations deal with the public.

It is plain that any regulations of railroad freights, in such cases, do not affect those wealthy transportation corporations who send their cars to all parts of the United States, unless some special provision is made therefor.

Competition can therefore be said to have shown itself so imperfect hitherto as to have been incapable of the general good result of uniformly preventing unreasonable charges or preventing injury to business at points along the lines of the roads, even if the charges for freight were reasonable.

In Great Britain as well as in the United States, legislative wisdom and ingenuity have been directed toward railroad rates and tariffs by acts of Parliament or the Legislatures.

LEGISLATION INEFFECTIVE TO REGULATE RAILWAY CHARGES.

These tariffs were either inserted in the respective charters or in general laws. As far as freight tariffs are concerned, it is laid down by competent authorities that, to fix general tariffs inflexible for a period of years, which must be the case if they are created by the Legislature with no provision for modification except by legislative action, seems to be wholly impracticable. Where it has been attempted it has always failed, never being properly complied with. What is reasonable for one road is not for another and would destroy the latter. What would be reasonable in one season might be very burdensome at another—peace or war, famine or plenty, the state of the domestic or foreign markets would exercise vast influence upon the proper adjustment of such tariffs.

On the continent of Europe this matter is looked upon not as a judicial or legislative, but an administrative function. The finance or commercial ministerial department of the State is intrusted with it. It is exercised by trained government officials of the highest class, in conference with deputations from the Boards of Trade and from the railroad companies. It is liable to be modified as circumstances demand.

Satisfactory as their mode may be, and it is represented as working well, it would be difficult to introduce it here for reasons which will readily suggest themselves without being specially pointed out. Nevertheless, the facts stated show the probable impracticability of establishing an inflexible rate for freight transportation, and point to the necessity of providing for modifications from time to time, as the circumstances of the country and of the railroads may demand. This discretion may be vested in such persons as the wisdom of the Legislature shall see fit to confide in, and it may be controlled,

if deemed expedient, within limits, and exercised in methods to be established by law.

The basis of a tariff adopted in the third section of the law, entitled "An act to prevent unjust discrimination and extortion," etc., that is to say, that the rate of toll on any day hereafter, for transportation from any point on the line of road to any other point on the line, shall not be greater than that charged on the same day and month in the year 1870, for similar quantities of the same class of property, does not recommend itself to the judgment of the Commissioners. While the adoption of this basis avoids forbidden special legislation, and yet by a general law deals singly with every road according to its previously fixed rates, and thereby intends to mete out equity, it is, in the first place, in the highest degree inconvenient, both for the shipper and the railroad company, almost to such an extent as to be impracticable. In the second place, it leaves to chance whether the shipper, who is often bound to ship at a particular time, will lose or gain by the rates he may happen upon. In the third place, it is impossible to tell how reasonable or unreasonable the rates were on the various roads during that test year. In addition, the year 1870, like 1869, presented the most astonishing fluctuations in the charges for freight. The Hon. Charles Francis Adams, Jr., one of the Railroad Commissioners for the State of Massachusetts, in one of the very able essays he has written on the subject of railroads and their management (see *Essays Boston, 1871, p. 367*) remarks: "So far as railroads are concerned, competition puts both certainty and responsibility out of the question; it renders the first impossible, and by division destroys the last. Most conclusive illustrations of all these propositions, as well as the utter insufficiency of the State Legislature to deal with the subject, may be found in the experience of the year 1870. During that year competition was bitter in the extreme; the rates made East and West were simply ruinous. On certain descriptions of freight they were literally reduced to nothing. Of course this could not last. Early in September, 1870, representatives of the competing lines met in New York, and proceeded to put a stop to competition in the only way possible among monopolists—by combination. The parties in interest were the New York Central, the Erie and Pennsylvania Central. The competition was mainly from Illinois to New York. In both Illinois and New York laws forbidding the consolidation of competing lines were in force, and all these roads were carrying on operations in one or both of these States. At the meeting in question it was decided to 'pool' the earnings of the lines to all competing points. In other words, all receipts from that business which was supposed to receive a peculiar benefit from competition were to be paid into a common fund. Competition was to immediately cease, fixed rates to be charged, and thus, at least, all the great trunk lines were to be practically consolidated in so far as the business community was concerned." The fluctuations in freight charges during 1869 and 1870 between New York and Chicago were from \$5 to \$37 per ton, and between the same point and St. Louis from \$7 to \$46 per ton. The Erie Railroad in 1869 carried goods to Chicago at as low a rate as \$2 per ton, and from this bounded back to \$37 per ton. Those conditions and rates having been generally participated in by the railroads of this State, the Commissioners, therefore, recommend to abandon the rates of 1870 as a basis, as in every view it has presented itself it does not seem to furnish any just and uniform standard. There is, however, in the same act, a very valuable feature, tending to prevent unjust discrimination in the tariffs at terminal and competing points, and at those stations which are not such. It is to be found in the first section, where it is provided: "No railroad corporation, etc., shall charge and collect, for the transportation of goods, merchandise or property on its road for any distance, the same nor any larger or greater amount as toll than is at the same time charged or collected for the transportation of similar quantities of the same class of goods, merchandise or property over a greater distance upon the same road. Nor shall such corporation charge different rates for receiving, handling or delivering freight at different points on its road, or roads connected therewith it has a right to use. Nor shall any such railroad corporation charge or collect, for the transportation of goods over any portion of its road, a greater amount as toll than shall be charged by it for the transportation of similar quantities of the same class of goods, merchandise or property over any other portion of its road of equal distance."

A similar law in Ohio was passed as early as 1852, but it only provides that it shall not be lawful for any railroad company to charge or receive any higher rate for transporting similar merchandise over a shorter distance of the road than is charged according to its fixed tariff for transportation to and from places of intersection (terminal or competing points) aforesaid. It is understood that a similar law to the one in Ohio has been enacted in the State of Michigan. As late as May 30, 1871, the Commonwealth of Massachusetts provided that no railroad corporation shall charge or receive, for the transportation of freight to any section on its road, a greater sum than is at the same time charged or received for the transportation of the like class and quantity of freight from the same original point of departure to a station at a greater distance on its road in the same direction.

DISCRIMINATIONS IN FREIGHT CHARGES SHOULD BE PROHIBITED. The difference is obvious. While the laws of those States merely prohibit a greater charge being made from intermediate points than from terminal ones, the law of Illinois establishes a charge in every case the same for equal distances. This part of the law has the advantage that its constitutionality cannot be questioned in any court. Charges must be reasonable; that is admitted by all the corporations themselves, is expressly stipulated in some of their charters, and necessarily implied in all, and nothing could be more unreasonable than to charge a greater price for a less distance. This section does not fix a tariff for the roads, but merely prohibits them from fixing a discriminatory one, and prevents them from adopting an extortionate one. It coincides with the railroads themselves, because, considering that with most railroads in our State the local business is by far the largest, it must be to their interest to build up local trade and not to drive it to terminal or competing points, just as it is their true interest to charge moderately for the internal transportation of iron, coal, lumber and provisions, so as to stimulate local enterprise and stud their lines with thriving villages and towns. Upon this principle of the law just referred to, our State should plant itself firmly. It is so just in itself, so beneficial ultimately to the roads, so free from legal objections, and withal affording so great a relief to our people, that its execution should be rigidly enforced by the Government.

PASSENGER FARES.

In regard to the passenger fare, the complaints have neither been very numerous, nor have they been urged by the community with the same vigor and intensity as those relating to discrimination and extortion in the matter of freight. The reason of this may be found in the fact that the different companies, by providing their more regular customers along the line with commutation and season tickets, have really, in some cases, reduced the fares to a figure within the sum limited by law, and, in many instances, to very much less than the railroad companies are entitled to charge under the classification adopted by the present Legislature at its first session. The number of persons, however, to whom season and commutation tickets are issued, is but a very small part of the whole number of passengers carried by the railroads, and the relief thus afforded is only partial and slight. The great mass of passengers are still unprotected by the law in regard to classification, and will continue to be so, so long as that law shall

be disregarded and defied by the railroad companies. The classification itself has evidently been made with a view to deal quietly and equitably with the railroad companies, and to avoid collision with the constitutional prohibition of special legislation.

The gross earnings upon which this classification rests may not always be an exact test of the financial prosperity of a railroad, yet perhaps a better one could not be devised—all such tests being more or less unsatisfactory.

It may be said, that in spite of the legislative intention to treat the different corporations equitably, in allowing them to charge according to their pecuniary ability, such object is frequently defeated.

Should a road belonging to Class "A," and consequently permitted by law to charge only a low rate, have a competitor in a road belonging to a lower class, the latter road would, in order to compete successfully, be compelled to reduce its rates to coincide with those of the road in Class "A." The Chicago & Alton Railroad, for instance, is vigorously competed with by the Illinois Central Railroad for the St. Louis passenger traffic, the latter having control of the Vandalia & St. Louis road. The one is in Class "A," and the other in Class "B." But should the Chicago & Alton Company charge the now legal rate of two and one-half cents per mile for passenger fare, it would not be long before the Illinois Central Company would be compelled to come down to the same rate, or surrender all claims to that business.

STATE REGULATION INSUFFICIENT AS REGARDS RAILWAYS

TRAVERSING DIFFERENT STATES.

The regulation of the railroad system by legislative enactments is a great problem, waiting its successful solution in the future. Whether it will ever be successfully solved by the action of the several States is doubted by many. Our most important railroad lines having become national—in fact, it might be said international—some of the "best minds in the country," which have attentively studied the subject, have intimated that, as Congress has the undoubted constitutional power to regulate commerce with foreign nations, and among the several States, the whole control of the railroad management as relates to the interests of the people at large, should be committed to the National Legislature. In a late address by the present Secretary of the Treasury the same idea is advanced.

Whatever may be thought of the expediency or constitutionality of such proposed regulation by Congress of the business passing through different States by railroads, it would seem that no authority is given by the Constitution, in the article just quoted, for the regulation by Congress of the prices for transportation of persons or property between different points wholly within the same State.

The great subject of complaint, so far as the same has come to the knowledge of the Commissioners, relates to alleged injustice committed by the different railroad companies in regard to local transportation, and this can be controlled, if at all, only by State authority.

THE BELGIAN SYSTEM.

There is one—and, if the reports and information the Commissioners have been correct, a very effective and beneficial mode—adopted by some, if not most of the Continental States of Europe, and also, very lately, in the course of adoption in Great Britain, of dealing with the railroad interest of the people. The governments there have retained, as owners, some two or more quite important lines, the tariffs of which they regulate in the interest of the public, taking care at the same time that neither the financial interests of the State nor of the private railroads suffer. This governmental action is said to satisfactorily affect the management of the railroads not under the State control. It may be said to act morally and protect all the interests without the slightest actual interference with the corporations. In many of the States, our own included, constitutional obstructions would have to be removed before the State could buy or obtain, by condemnation, existing roads, or build new ones. In addition, it would be necessary for the people to repossess themselves with the confidence they once had in the State management of such enterprises. The people almost everywhere have, in former times, suffered seriously by such State management; but they ought to consider that those failures occurred at a time when no one else understood better how to deal with those improvements, and ought to reflect that almost every private railroad corporation in the country has equally failed, and that the magnificent structures now covering our favored land are built upon the ruins of thousands of private fortunes. The country may not be ripe yet for the solution just indicated, but it is perhaps the one most likely to be ultimately adopted, and it is almost the only one that has thus far succeeded.

VIEWS OF THE RAILROAD COMPANIES.

The reports of many of the railroad companies show, and the views expressed to the Commissioners by many prominent representatives of those corporations in this State leave no doubt, that those corporations are strongly impressed with the idea, that outside, perhaps, of a few police regulations, the Legislature has no power, under the Federal Constitution, to modify or regulate, in any manner, their actions and doings, and that their charters furnish the only measure of their rights and duties. They seem to rely on decisions of courts made generations ago, in cases where chartered rights of strictly eleemosynary corporations, such as country colleges, or small charitable institutions, were under consideration—decisions made at a time when such colossal corporate enterprises wielding the resources of kingdoms, spanning continents, and carrying the commerce of an empire, were never anticipated. They seem to overlook the fact that railroads at this day have, to a very great degree, superseded all other modes of transportation by land, and that they have become a controlling element in a nation's life in all its ramifications.

They do not consider, apparently, that when a part of the sovereignty of the State, the right of eminent domain, was freely delegated to them, and when, in order to assist them, cities, counties and towns were allowed to exercise the taxing power, all of which could only be justified under the plea that it was for the public good, that they, therefore, ceased to be strictly private, and became at least *quasi public* corporations. They do not seem to reflect that such powers as were granted to them must always be understood to have been granted with the reservation that they should be exercised for the public good also, and must, from the necessity of the case, become controllable by the sovereignty of the people, so as to have the objects of such grants justly accomplished.

The public mind has slowly and gradually undergone a change in regard to what were called chartered rights, or rather has adapted its judgment to the new emergency; it has come to consider what were once called precedents, not as incorrect in themselves, but as wholly inapplicable to the present times. "Times change and men's minds with them." The courts of the country being, in the main, filled with men whose powers of observation, whose experience in the affairs of life, whose grasp of mind and comprehensiveness of view are equal, if not superior, to that of most enlightened citizens, will not be slow to judge of the relations of railroad corporations to the State, their rights and duties, not by ancient precedents, but by sound and statesmanlike views of what those corporations really are in their state of full development—and what must have been the real object of their creation. They have to be viewed as manifestations of useful power and magnitude, unparalleled in former history, and to be judged by the living present, and not by the dead past.

GUSTAVUS KOERNER,
RICHARD P. MORGAN, JR.,
DAVID S. HAMMOND.